

N. A. Wood

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A BI-MONTHLY MAGAZINE OF  
WESTERN ORNITHOLOGY

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## THE WHITE-TAILED KITE

WITH SEVEN ILLUSTRATIONS

By GAYLE PICKWELL

**Introduction.** As short a time as four years ago "White-tailed Kite" was merely the name of a rare North American bird which the writer, at that time, did not anticipate ever seeing in life. However, by one of those turns of destiny which abruptly change the course of events for many of us, I crossed the width of the continent to enter upon a position in San Jose, California. Within a month I had seen White-tailed Kites in the field and from that moment they have become, to me, objects of increasingly great interest and information.

The ornithological literature containing references to the White-tailed Kite (*Elanus leucurus majusculus*) refers most frequently to Santa Clara Valley, California, as the place of the observations. Thus of eighteen references before me which have specific localities given, ten (Evans, 1887; Taylor, 1887, 1889, 1894; Bendire, 1892; Barlow, 1893, 1895, 1897; Wright, 1913; Grinnell, 1914) report some or all of their observations as pertaining to the Santa Clara Valley. Four of these refer specifically to San Jose (Bendire, 1892; Taylor, 1887, 1889, 1894). These last are of especial interest because of the opportunity thus given the writer to compare accounts of more than forty years ago with the situation as he finds it today. In spite of the fact that Taylor, in 1889, wrote of the Kite, "I venture to assert that there are not more than four pairs this year breeding within a radius of seven miles of that city [San Jose]," today, forty-one years later, there are still that many or more.

So it is with pleasure that I listen frequently to excited accounts from friends or students who tell of white birds with black wing patches that hover like Sparrow Hawks and dangle their legs. For thus information is brought, inadvertently, that our Kites, of this location or that in Santa Clara Valley, are still a-wing. In some such manner the knowledge was secured of the breeding birds the accounts of which shall form the major portion of this article. To me, through a student relative (Mr. Elton Bowman) of the ranchers concerned, an account was given of birds "like sea gulls and with heads like owls" that were nesting in "mush" and live oaks on J. A. Slatore's ranch some two or three miles south of Evergreen. Through Mr. Earland Whaley, a son-in-law of Mr. J. A. Slatore, and through Mr. Slatore himself, the nest sites about to be described were pointed out June 3, 1928. To the above gentlemen the writer is greatly indebted for their courtesies and the most gratifying interest they showed throughout the study.

To Mr. Lester Hannibal, of San Jose, California, the writer is indebted for much assistance in tree-climbing, in photography and for records secured on days when the writer could not go into the field.

**The nesting territory.** A spur of the Mount Hamilton Range, the Silver Creek Hills, extends into the Santa Clara Valley about seven miles to the south and east of San Jose. On the tip of this spur is the little village of Evergreen and south from Evergreen some three miles is the ranch above mentioned.

To one acquainted with the foothills of the inner coast range of California but little need be said of their topography and flora. In their wider valleys intermittent streams are lined with willows and sycamores, with scattered coast live oaks (*Quercus agrifolia*) and orchards of valley oak (*Quercus lobata*) on the rolling lands of either side. The narrower cañons and wetter stream beds have California

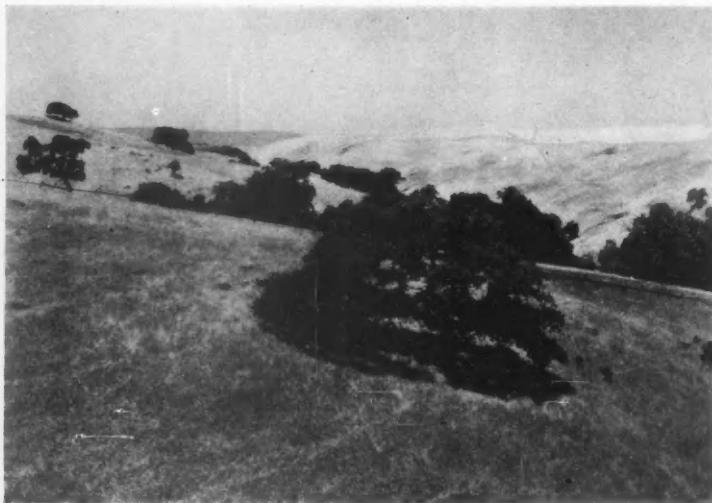


Fig. 76. THE HOME OF THE WHITE-TAILED KITE IN THE SILVER CREEK HILLS, SANTA CLARA COUNTY, CALIFORNIA. NEST NO. 2 WAS IN THE VALLEY OAK OF THE FOREGROUND.

laurel (*Umbellularia californica*), occasional alder, cottonwoods, and maple (*Acer macrophyllum*). The slopes here have buckeye (*Aesculus californica*) and undergrowth of poison oak (*Rhus diversiloba*). (See fig. 76.)

The Slatore ranch lies in the foothills whose summits are grass-covered with wild oats and bromes, with scattered valley oaks and live oaks, and here and there a cluster of California coffee berry (*Rhamnus californica*) and gnarled *Sambucus*. Rocky outcrops, where more moisture may be trapped, have curious copses of scrubby growths of toyon, holly-leaved cherry, sages and sage brush; and the gullies lined with buckeye, California laurel, and poison oak run down to Silver Creek where the laurel and willows predominate. But the hills are mostly smooth as velvet, golden velvet most of the year, and green oaks are scattered over the velvet, like buttons on a buxom vest. In three buttons on this velvet vest were occupied nests of the White-tailed Kite.

That such a habitat is not an unusual Kite home is shown by the fact that all the Kites of Santa Clara Valley today are, excepting one or two pairs, restricted to the lower foothills of the Mount Hamilton Range and Santa Cruz Mountains, on either side of the north end of the Valley. The exception is of not more than two pairs that occur to the north of San Jose between that city and the Alviso salt marshes. These frequent the cottonwoods and eucalyptus trees of the Coyote Creek and, not infrequently, are seen hunting over the treeless marshes at the foot of the Bay in common with Marsh Hawks, native there, and Turkey Vultures and Red-tailed Hawks from the hills.

To some writers the White-tailed Kite is a bird only of the marshes, with their broad stream beds lined with willows and cottonwoods, to others they are of the hills. Cooper (1870) assigned them, in winter (nests and eggs from California were unknown to him), to the tule marshes of the Sacramento and other valleys, though they had been seen as far north as Bolinas Bay and near Monterey. Evans (1887) found a number of nests along the Russian River, all near a body of water. Bendire (1892), quoting B. W. Evermann, writes of solitary individuals over the San Buenaventura marshes toward Saticoy. Again Bendire, quoting A. L. Parkhurst, describes their habitats as on banks of streams or fresh water marshes if live oaks or willow groves are near by. And lastly he, quoting L. Belding, writes that, in the vicinity of Stockton, they are rarely away from the tule marshes. Barlow (1897), who over a period of three years took nine sets of eggs of the White-tailed Kite in Santa Clara County, writes that, with few exceptions, they were nesting in level or slightly rolling country where live oaks were in abundance. Ray (1904) found nests in the foothills south of Novato, Marin County. Wright (1913) saw them in the vicinity of Ravenswood, Santa Clara County (lowland country northwest of Palo Alto). Grinnell (1914) records two Kites over a meadow near a line of willows bordering the Russian River near Forestville, Sonoma County, and again over the Suisun marshes near Cygnus, Solano County. Peyton (1915) found Kites in a willow swamp near Sespe, Ventura County, and they nested in oaks and a sycamore there (he does not say in the swamp). Van Rossem (1923) noted one flying up and down the Mohave River, where cottonwoods and willows lined the stream, below Victorville, San Bernardino County. Of these, only Evans, Bendire (A. L. Parkhurst), Barlow, Ray and Peyton describe breeding sites, and though there are other nesting references before me they do not give the general conditions. Of the above five references two describe foothills (with oaks), two stream banks (or marshes with live oaks and willow groves near by), and one a willow swamp.

**Nest spacing.** Two of the trees on the Slatore ranch were valley oaks (*Quercus lobata*), and the third a coast live oak (*Quercus agrifolia*). The three formed an oblique or scalene triangle on the rolling hills with the longest side 320 yards and the others 200 and 175 yards respectively. To anyone conversant with the wide spacing of most raptorial birds this juxtaposition of the Kite nest territories seems unusual—indeed, so much in contrast with their near-relatives, semi-communal. Subsequent activities of the Kites (their concentration on each other's territory, for instance) indicated that this method of nesting was not unusual and, perhaps, judging from the fact that more birds were frequently seen than nests accounted for, one or two other pairs may have been in the vicinity.

Remarks of other observers pro and con this remarkable nesting habit are of considerable interest. Thus Evans (1887), in describing conditions on the Russian River, says, "I saw several pairs, each pair separated from the other by several

miles." On the other hand, Peyton (1915) describes a situation at Sespe, Ventura County, wherein two Kites had nests within 200 yards of each other. So far as can be learned these are the only writers who make any reference to nest spacing. What the significance of close nesting may be, whether of ancestral habit developed through an exigency of another day or practiced today through some benefit of aggregation, is, after all, conjecture. Certainly it cannot be explained, as are so many nesting associations, through want of proper nest sites.

**The nesting tree.** The heights of two of the nests were estimated to be from twenty-five to thirty feet above the base of the tree. These were in valley oaks. The height of the third, in a coast live oak, was carefully measured. It was unusually high, for the result showed it to be exactly 59 feet. In this case the oak was on a steep slope so that by walking a few hundred feet up hill one was soon on the level of the nest.

The following table has been compiled from the literature regarding the nesting trees of various White-tailed Kites. Most of the figures are probably estimates since no evidence is given to the contrary.

WHITE-TAILED KITE NESTING TREES

Authority	Tree species	Height
Evans (1887)	maple	not given
do.	oak or sycamore	40 feet (av. of 8)
Taylor (1889)	live oak	"topmost branches"
do.	live oak	35 feet
Bendire (1892)	cottonwood	"topmost limbs"
(B. W. Evermann)	live oak	45 or 50 feet
do.	live oak	40 or 50 feet
(A. L. Parkhurst)	live oak	30 feet
Barlow (1897)	live oak	25 feet
do.	live oak	not given
do.	live oak	20 feet
do.	live oak	20 feet
do.	live oak	35 feet
do.	"slender oak"	35 feet
Peyton (1915)	live oak	50 feet
do.	"small oak"	18 feet
do.	"oak"	20 feet
do.	"big sycamore"	"top"

The nests of the Kite are not placed in firm crotches as are those of most tree-nesting hawks but, instead, among the slender branches of the extreme top of the tree. So placed, they are often well concealed from below but from above fully exposed. This fact has been noted by most writers. From the standpoint of the Kite it may be very unfortunate, for the nest contents are in full view of other hawks against which these birds constantly contend. It may be that such nest-placement is one detrimental factor in the Kite's struggle for existence.

**The nest.** The nest of the Kite has been described over and over again, almost as frequently as the eggs, in the ornithological literature. Such being the case, but few words will be given here and these supplemented by a table constructed from the descriptions of others. A rather loose pile of dry sticks is gathered into the upper branches where the nest is to be located and a slight lining of straw, grasses or rootlets put into the shallow cavity within. (See fig. 77.) Nest number 2 consisted, in its outer structure, of twigs and dead branches of the valley oak. Its lining was of brome grasses, wild oats and barley stems.



Fig. 77. EGGS IN NEST NO. 2 OF THE WHITE-TAILED KITE, PHOTOGRAPHED *in situ*.

NESTS OF THE WHITE-TAILED KITE

Authority	Date	Condition	Body	Materials	Lining
Evans (1887)	May 22, 1886	.....	dry sticks	grass	
Taylor (1887)	early May, 1887	old nest	sticks	new feathers	
Taylor (1889)	Feb. 18, 1889	new nest	oak sticks	stubble	
Taylor (1889)	March 9, 1889	same nest as of May, 1887	.....	.....	.....
Bendire (1892) (B. W. Evermann)	.....	flat structure	sticks	straw (barley?)	
(A. L. Parkhurst)	.....	.....	dead twigs	dry stubble	
Barlow (1897)	April 19, 1894	(nest collected)	small oak sticks	dry stubble and Spanish moss	
Barlow (1897)	March 17, 1895	new nest (location as of April 19, 1894)	.....	.....	
Barlow (1897)	April 9, 1895	same nest as above	.....	.....	
Barlow (1897)	March 24, 1895	unusually large, old?	.....	long dry grasses	
Barlow (1897)	April 18, 1895	.....	.....	dry stubble, Spanish moss	
Barlow (1897)	March 14, 1896	15 in. in diam., 6 in. thick	.....	.....	
Ray (1904)	March 31, 1902	8 in. over-all, cavity 6½ in. in diam.	twigs	grass	
Ray (1904)	April 20, 1902	as of March 31, 1902	.....	.....	
Peyton (1915)	April 22, 1914	"substantial"	oak twigs	weed stems	
Peyton (1915)	May 23, 1914	"flimsy"	willow twigs	rootlets	

**Nesting dates.** Since nearly all dates in the literature are given by egg-collectors who took the eggs the dates they give are, at best, merely indicators of the initiation of nesting activity. However, there is a remark or two about activities prior to nesting as well as about some of the nest-building activities. A. L. Parkhurst (Bendire, 1892) states that the Kites can be found at the nest-site in January. Taylor (1889) saw a Kite carry a stick into a live oak and discovered a Kite nest, without eggs but with a new lining, on February 19, 1889. Of these remarks, that of Parkhurst probably loses its significance since Kites may be found near

their breeding site at all times of the year. Taylor's (1889) record of a full set of eggs on March 9 is the earliest. Many other sets have been taken in March, several in April (mostly known second sets), and a known second set in June. Below is given a table of collectors' dates as far as ascertained.

COLLECTORS' WHITE-TAILED KITE EGG-TAKING DATES

Authority	Date	No. of eggs	Condition of eggs	Place
Evans (1887)	May 22, 1886	5	fresh	Russian River
Taylor (1887)	early May, 1887	4	slightly incubated	San Jose
Taylor (1889)	March 9, 1889	4	not given	San Jose
Bendire (1892)				
(B. W. Evermann)	May 4, 1890	3	nearly ready to hatch	Santa Paula
(B. W. Evermann)	April 12, 1891	5	fresh	Santa Paula
(B. W. Evermann)	April 12, 1891	4	fresh	Santa Paula
(B. W. Evermann)	early June, 1891	not given	second set	Santa Paula
(A. L. Parkhurst)	March 15 to April 10	(3 sets)	not stated	San Jose
Barlow (1897)	April 19, 1894	8	not given	Santa Clara Co.
Barlow (1897)	March 17, 1895	4	slightly incubated	Santa Clara Co.
Barlow (1897)	April 9, 1895	5	fresh (2nd set)	Santa Clara Co.
Barlow (1897)	March 24, 1895	5	incubation adv.	Santa Clara Co.
Barlow (1897)	April 15, 1895	4	fresh (2nd set)	Santa Clara Co.
Barlow (1897)	March 10, 1896	4	incubation one-third advanced	Santa Clara Co.
Barlow (1897)	March 29, 1896	4	not collected (2nd set)	Santa Clara Co.
Barlow (1897)	April 13, 1895	4	incubation one-half advanced	Santa Clara Co.
Barlow (1897)	April 13, 1895	4	incubation one-half advanced	Santa Clara Co.
Barlow (1897)	March 29, 1896	4	not stated, adults as of April 13, 1895	Santa Clara Co.
Barlow (1897)	March 14, 1896	4	fresh	Santa Clara Co.
Ray (1904)	March 31, 1902	3	almost fresh	Novato, Marin Co.
Ray (1904)	April 20, 1902	5	incubation begun (2nd set?)	Novato, Marin Co.
Peyton (1915)	May 28, 1914	4	fresh (2nd set, probably not collected)	Sepe, Ventura Co.

Peyton found two nests with young (April 22 and April 25, 1914). Of these the second lost its young. One young left the first nest on May 16, 1914 (last visit); others were almost ready to do so. In a letter to the writer, Mr. Laidlaw Williams tells of a nest with young, discovered on May 26, 1928, in the Carmel Valley. These young had gone from the nest, but they were in the vicinity, May 29.

The number of sets of eggs Kites will lay, if first ones are destroyed, is certainly two, probably three. How many broods of young they will raise is another thing. Evidence, as given below, indicates that the incubation period is not less than thirty days. Young are in the nest about thirty days. If Kites, on the average, begin incubation on March 15, then the resultant young will leave toward the middle of May (Peyton and Williams, above). A second set would carry the birds to August 1.

The date of the discovery of the nests on the Slatore ranch was June 3. Two of these hatched their young during the first week of July; the successful young left at the end of July and during early August. These could have been second broods. The fact that three birds were incubating simultaneously indicates strongly that such was true. If they were not second broods, what prior ordeals these birds must have suffered from the inception of their nesting efforts in March!

A strange observation in this connection was made on August 3, 1928. While I was doing some work along Coyote Creek three or four miles north of San Jose a Kite with a stick in its talons was seen to fly into a tall eucalyptus.

**Chronology of nestings.** At the time of the first visit to the Slatore ranch, Kites were sitting on the three nests. One nest examined had four eggs; the con-

tents of the others were not ascertained at this time. During our visit Kites hovered and sailed near. Since some were in the air in all cases when the nests were occupied it is presumed that these birds were the males, though no certain method was developed whereby sex could be determined in the field except that a slight discrepancy in size was often apparent when two or more Kites were close together. Other writers ascribe nest-building (Bendire, 1892) and incubation (Barlow, 1897) to the females and certain reactions of nest solicitude (Barlow, 1897) to the males, without making clear how they determined the sex. In any case, the birds in the air maintained a constant production of various notes (to be described later) and frequently uttered also at each other in aerial attack.

The visit above described was made on June 3, 1928, and visits were made thereafter at varying intervals until the last nest was empty. This occurred on August 10, 1928, and observations were made on a total of fifteen days during this period. The dates of visits were as follows: June 3, 21, 28, 30, July 1, 4, 10, 23, 25, 27, August 5, 10, and 15.



Fig. 78. NESTLING KITES REMOVED FROM NEST AND POSED FOR PHOTOGRAPH. THE CAMERA CAUGHT THE NICTITATING MEMBRANE CLOSED IN THE RETARDED LEFT-HAND NESTLING.

The three nests may be designated 1, 2, and 3. Numbers 1 and 2 were in valley oaks, number 3 in a live oak. A Kite had been seen on number 1 on June 3, but no bird was observed on it subsequently though it was not remarked on every trip. Lester Hannibal climbed to it on July 1 and found it empty and partially destroyed. The incubating bird of nest number 2 was observed on every visit and the nest itself frequently examined. Eggs were still present on July 4 (a total of 31 days of incubation to this date), but on July 10 it was empty except for one or two fragments of shell. Undoubtedly the eggs had hatched between July 4 and July 10 and something had destroyed the young. A discussion of the possible offender will be undertaken later. Nest number 3 was not observed on every visit, but the incubating bird was occasionally seen as she deserted and, because the tree, on a steep slope, allowed one to get above the nest without removing oneself far, she could be observed on the nest if one approached near enough. The incubating bird was seen on this nest on June 3, 30, and July 4; but on July 10 the Kite was not

on the nest but hovering over it in a very solicitous fashion. It is probable that the eggs hatched between July 4 and July 10, as they did for nest number 2. Lester Hannibal climbed to this nest on July 23, to find four young, three considerably larger than the fourth. The largest was approaching a fully fledged condition, the smallest was still in heavy bluish down. He again climbed to the nest on July 25, brought the smallest and the largest to the ground and made measurements and notes before replacing them.

On July 27 the writer, with Lester Hannibal, visited nest number 3. Mr. Hannibal climbed the tree and let the four young Kites down in a sack. On the ground photographs and observations were made. The smallest was still in heavy bluish down and the others, though fully fledged, showed slight gradations as if there might be a difference in their ages as well as between them and the smallest. (See fig. 78.)

On July 31 Mr. Hannibal again climbed to nest number 3, whereupon two of the nestlings flew off. One essayed a 200-yard flight, was captured and measured. The retarded or smallest nestling was losing its down, and feathers were conspicuous.

On August 5, Mr. Hannibal climbed to the nest. The third nestling left, but the smallest was captured and measured. And for the last time, on August 10, the tree was climbed by Mr. Hannibal and measurements were secured of the last nestling, then in the nest ten days after the first had gone.

Though no systematic attempt was made to follow growth of the Kites, the measurements procured by Mr. Hannibal have a few points of interest and are given in the following table. Chiefly to be noted is the retarded development of one of the nestlings, called "smallest".

MEASUREMENTS OF NESTLING KITES OF NEST NO. 3

	Date	Extent	Length	Tail	Extent of one wing
largest	July 25	68.5 cm.	28 cm.	7.3 cm.	45.2 cm.
smallest	July 25	28 cm.	16.5 cm.	—	12.8 cm.
one at nest—					
leaving	July 31	75 cm.	—	—	—
smallest	Aug. 5	51 cm.	25 cm.	4 cm.	—
smallest	Aug. 10	64.5 cm.	26.5 cm.	7 cm.	—

Similarly, his records of coloration of a nestling Kite shortly before nest-leaving merit inclusion: breast, yellow brown; wings beneath, white; wings above, blue gray; crown, mottled brown and white; tail above, light gray; back, yellow-brown; toes and tarsus, yellow; beak and claws, black; eyelids, blue; iris, brown. These notes were made by Mr. Hannibal in the field without recourse to any color standard. For their general accuracy the author can vouch from subsequent handlings of the fully fledged young. It is interesting to note that the iris color was markedly brown, whereas that of the adult is red. However, Allan Brooks' painting of a young Kite in Dawson's "Birds of California" (facing page 1648, Booklovers Edition), though otherwise quite accurate, has the iris red. It would be of some interest to know when the red coloring of the iris is acquired.

**General activities of adults.** The White-tailed Kite is one of the most beautiful and graceful of all raptorial birds and if it does not have the dash and vim of the falcon, still it compensates with a buoyancy and ease of flight that one would scarcely expect in a bird of its size. Hudson (1920), in his "Birds of La Plata," gives one of the prettiest of all word pictures in his short article on the "White Kite" of Argentina. He writes: "It delights to soar like the Martins, during the high wind, and will spend hours in this sport, rising and falling alternately, and

at times, seeming to abandon itself to the fury of the gales, is blown away like thistle down until, suddenly recovering itself, it shoots back to its original position. Where there are tall lombardy poplar-trees these birds amuse themselves by perching on the topmost slender twigs, balancing themselves with outspread wings, each



Fig. 79. WHITE-TAILED KITE IN "STAND" OVER NEST IN VALLEY OAK.

bird on a separate tree, until the tree-tops are swept by the wind from under them, when they often remain poised almost motionless in the air until the twigs return to their feet."

It was this quiet hover or "standing still" in the air that gave the writer his opportunity for the photographs of the adult above the nest (fig. 79). By using

a view camera with a long bellows, a twenty-inch lens and extremely fast cut-film, the photographs were secured from the ground at a distance of about forty feet from the nest. Here, working from a blind made of valley oak and California coffeeberry limbs, the whole covered by canvas, exposure after exposure was made as the adult now and then made a momentary "stand" above the nest. Not always did she come in thus, but frequently enough to encourage persistence in photography.

As far as one can see the faintest outline of its silhouette a Kite is identifiable. No other bird flies so characteristically with wings, whether in beat or sail, at the peculiar angle that a Kite maintains. This is not a set of wings in a straight line such as a large hawk or gull maintains in sail, but that with wings slightly raised and down-curving at the tips. No other hawk flies like this, indeed no other California bird.

The Kites have a quirk of temperament that sends them persistently at other large birds. Thus Ray (1904) speaks of their "tireless energy driving away California Crows" from their nest sites. But Peyton (1915) intimates that the Kites he observed were subject to "persecution by the Crows". However, the large soaring hawks are the chief objects against which they constantly contend. De Fremery (1929) describes the attack of a Red-bellied Hawk by a Kite near Olema, Marin County, and the writer has seen them frequently dashing upon Marsh, Red-tailed and Swainson hawks. In fact many of our records of Kites have come about because our attention has been drawn first to a large hurried Buteo in the distance and glasses showed there not only Buteo but Kites above swooping down, one, then the other (Kites are nearly always in pairs), in huge parabolas reaching a hundred feet or more above the harried giant. Down one comes with a rush and swings up again. Immediately after, the other one drops, then up, and so around and around they alternate until the distance and blue swallows up Buteo and tormentors. This game is played the year around, in the breeding season and out. Perhaps, as with the excitement that small birds display over the discovery of an owl, there may be a meaning in the Kites' pugnacity. It may well be that the contents of the Kite nest, in the very top of its oak, concealed from below but completely exposed from above, are a temptation to these big hawks the Kites so persistently annoy. If so, then there is something of significance in the fact that Turkey Vultures, though they have always been, in the Kite territory, more numerous than all other large birds, are never molested.

The leg-dangling habit of the Kites is one of their most conspicuous oddities. On the nesting territory the protesting birds flew here and there nearly constantly, uttering their cries, beating the air slowly with short strokes, the wings held up at a sharp angle above the back, the legs dangling from a point about the center of the body. If the incubating bird is the female, then these leg-dangling birds are the males. (See fig. 80.)

On the Slatore ranch there were more Kites than nests accounted for. Students of mine, scouting the territory thoroughly, found two or three empty Kite nests. Whether these were nests formerly occupied or were "dummy" or cock nests is open to question. In any case most of the supernumerary birds were males, judging from their actions. They spent a great deal of their time in flying at each other in unsanguinary play, perhaps in territory protection, or in flying here and there with calls and leg-dangling protest while a human intruder was near.

The Kite hunts, not by soaring and searching from a lofty position as do Buteos, nor by the low harrier method of the Marsh Hawk, but by a rather erratic scouting from a position intermediate between these two. When prey is seen the bird

"stands" with wings quiet if the air is moving sufficiently to permit it to "kite", as its name would intimate its habit to be, or beats the wings slowly from an angle well above the back. During such a stand it drops its legs. If it stoops it makes no falcon drop of lightning speed with wings drawn in to a thin wedge along the sides of the body, but keeps them up in a V angle above and slips down with legs hanging and at a speed one would never guess was more than fast enough to catch a snail. But that they do catch prey, some of it very agile, there is no doubt. And that this method is used to catch it there is no doubt either, for they have been observed to do so.

On January 26, 1929, at the Los Altos Country Club, a Kite was seen to drop in the manner above described and fetch an object (perhaps a field mouse) from the



Fig. 80. WHITE-TAILED KITE ABOUT TO ALIGHT ON NEST.

grass. Williams (1929) describes such a habit on the part of the Kite and calls it a "little courtship act". It is possible that the leg dangling and stoop may, on occasion, be used in some such sense.

**Reactions of adults and young to an intruder.** Raptorial birds make a sorry matter of nest protection where humans are concerned. Such large and otherwise self-sufficient birds have never been forced by necessity to develop those striking methods of protection as the "abandonment-concealment" or "distress-simulation" that are such amazing features of most ground-nesting birds. Their solicitude does not even go to the extent of noisy distraction display that birds, otherwise deficient in nest-protective instincts, nearly always employ. Kites left their nests without protest or at best flew back and forth with mild cries of distress. Mr. Hannibal describes one instance wherein an adult bird swung near him as he approached nest and young. Only rarely did they come near.

Various egg-collectors have the following remarks to make of incubating Kites: Birds sometimes fly quickly away, again will hover over nest and utter sharp piercing

cries from time to time (Evans, 1887); Kite arose from nest but returned, sat on an oak and plumed feathers with apparent indifference while the eggs were secured (Taylor, 1887). Bird left nest when I was at quite a distance, quietly flying off to a nearby tree. When I had nearly reached the nest it would fly toward me and, when about 20 or 30 feet above me and nest, would balance itself in air as Sparrow Hawks and Bluebirds often do and with legs hanging down would utter its distress note a few times and then fly away probably not to return again but simply to watch me from some tree top several rods away (Bendire, 1892). Barlow (1897) describes an exceptionally aggressive pair wherein the male swooped down at him in a "furious manner", occasionally reënforced by the female. Others merely flew about uneasily, uttering their "plaintive whistle". Ray (1904) apparently mistook the peculiar leg-hanging as an evidence of distress simulation in nest protection for he writes, "as I ascended the tree the Kites began flying in an injured manner to draw me away". This is, undoubtedly, a misinterpretation. The remainder of his description of adult reactions is similar to the others here quoted except that he describes a case, as does Barlow (above), wherein the birds swooped at him as he climbed a tree that did not contain a nest but, as he ascended the tree that did, the Kites retired to a dead tree. Peyton (1914) writes that the adults deserted the nest when he approached within 50 to 60 yards.

The most precise statement one can make of the solicitude display of these mild birds is that it is variable but unimpressive. For instance, though the incubating bird of nest no. 2 allowed us, on the first two visits, to walk beneath the nesting tree before the bird deserted, on subsequent visits she deserted when I was at least 100 yards away. Indeed she had gone often before I was in a position to observe the nest. That she had been there recently was proved by the warmth of the eggs. Also during my attempt at photography the bird came into the nest with greater reluctance each day though the blind was made more and more effective. Experience with many incubating birds would lead me to have expected the reverse of this. The incubating bird of nest no. 3 frequently allowed approach close enough for her to be observed clearly upon the nest (the steep hill allowed one to get above the nest while yet within a hundred yards of it), but usually then deserted when the intruder was 75 to 100 yards away, leaving without a protest. As previously stated, a complaining Kite, or Kites, was usually to be seen beating slowly here and there over the nesting territory while an intruder was in evidence, and it is probable that these were males.

Peyton (1914) and Williams (letter) are the only references I have that mention nestling Kites. Peyton noted nestlings of two nests and makes the one remark concerning their reactions that they "manifested some uneasiness if we came very close." Unfortunately, at the first visit to the young in nest no. 3, they had advanced to a stage wherein they expressed distinct fear with the attendant defense-reaction. Thus no observations of the acquisition and evolution of these instincts can be given. However, a description should be of some interest.

If the adult Kites (and many raptorial birds) are deficient in nest-protective instincts it does not follow that the young are deficient in self-protective instincts. If they do not have that remarkable crouch-concealment or "freeze" of the young of ground-nesting birds, still they have more effective protection than the aimless flutterings of many young passerines. As might be presumed this consists of a highly developed "intimidation display". At first approach the young Kite spreads wide the wings and backs off with mouth agape (fig. 81), emitting a rasping note. If the tormentor persists, the bird thrusts its feet forward with a resultant dropping back

upon the tail. The third and last stage is to drop completely on the back and to present the most impressive weapons a Kite has, the talons (fig. 82). That this is purely an instinctive response to fear is proved by the fact that the nestlings would execute this maneuver when they had not yet learned to bite a finger thrust into their wide gape and clutched but weakly with their claws when an object was put into their grasp. Just prior to nest leaving they learned to use their beaks, and



Fig. 81. THE FIRST STAGE IN SELF DEFENSE WAS TO OPEN THE MOUTH ENORMOUSLY AND TO SCREAM.

their claws had, by that time, become very effective. However, never did they develop the venomous claw thrust the young of the Barn Owl are capable of at the climax of their similar reaction.

**Calls and notes.** Taylor (1889), Barlow (1897), and Peyton (1914) call the notes of the Kite a "whistle", "plaintive whistle", or "low, plaintive, musical whistle". Taylor adds, "like a Western Meadowlark". Evermann (Bendire, 1892) describes the note as a broken cry or scream. And Dawson (1923) writes that

the note is miscalled a "whistle" and he transcribes it as "*clewk, clewk*". Hudson (1920) calls the notes "long, distressful cries."

The notes are several in number and no one word or term describes them all. The most frequently uttered is a spasmodic short whistle: *kēēp, kēēp, kēēp*. At a distance it sounds like *chip, chip, chip*, or *kip, kip, kip, kip*, or even more chicken-like, *chēēp, chēēp, chēēp*. This is the note that is given as the birds beat slowly here and there with legs dangling, and it expresses the mildest solicitude. Undoubtedly Dawson (1923) means this note with his "*clewk*". The next is more highly pitched and longer, a "plaintive whistle" in truth. It may be transcribed as *krēēk* or *krēē-ēēk*. It may be as repeatedly and rapidly uttered as the former and expresses greater solicitude. The last and most solicitous, uttered usually only when an intruder is climbing the tree to a nest, is a prolonged *kēē-rāk* or *kēē-rēk*. This note comes at the end of a series of *kēēp* notes. Its terminus is lower and almost guttural, reminding me much of the whang of a focal-plane shutter. The notes of the young



Fig. 82. THE CLOSE OF THE INTIMIDATION DISPLAY CAME WITH THE NESTLING KITE ON ITS BACK AND THE TALONS DISPLAYED.

are two. They have a mild, high-pitched *krēē-ēēk* like the adults, and when at the height of their intimidation display they have a harsh scream uttered with the mouth enormously agape. This reminds one much of the rasping scream of the Barn Owl.

**Food.** Compared with the extensive data of foods that may be uncovered for most hawks, those for the Kite are meager indeed. Cooper (1870) states that the Kites' food consists "entirely of mice, gophers, small birds, snakes, etc.", but does not state his evidence. Similarly Barlow (1897) mentions gophers, field mice, wood rats, and lizards, but does not inform us how he secured his information. Fisher (1893) quotes Audubon as recording remains of birds in two stomachs and adds such general remarks as "small snakes, lizards, frogs and beetles." The only concrete evidence he records is that of a field mouse from a single stomach. Dawson (1923), without stating his authority, lists rats, snakes, gophers, mice, a few frogs, crickets and grasshoppers. Miller (1926) made a careful examination of a

Kite stomach and found there an exceptional volume of about 130 cubic centimeters of food consisting of the remains, in large part, of four meadow mice and an entire shrew (*Sorex ornatus*). Peyton (1914) reports that H. W. Carriger found a freshly killed ground squirrel in a tree beneath a nest. The writer found a ground squirrel (*Citellus beecheyi*) under similar circumstances. In addition eight pellets, removed from the nest with young, had remains of five skulls of the meadow mouse (*Microtus*).

Records of the Kite in the Santa Clara Valley from 1925 to 1930<sup>1</sup>. In addition to the observations of nesting birds above recorded I have at hand the following additional dates and places: November 19, 1925, Los Buellis Hills (east from Milpitas), one bird; January 9, 1927, Loyola Corners (San Antonio Township), three birds; March 20, 1927, Arroyo Calero (approaching Llagas Valley), one bird; April 9, 1927, Agnew, two birds; April 13, 1927, Loyola Corners (San Antonio Township), one bird; February 26, 1928, Coyote Hills (east end of Dumbarton Bridge), one bird; March 17, 1928, Loyola Corners, three birds; April 18, 1928, Silver Creek Hills (near Evergreen), one bird; June 30, 1928, Coyote Creek (about four miles north of San Jose), three birds; July 28, 1928, divide between Arroyo Calero and Llagas Valley, two birds; July 29, 1928, Alviso marshes, two birds; August 12, 1928, Menlo Park (San Mateo County), two birds; November 3, 1929, Loyola Corners, three birds; December 22, 1928, Coyote Creek (near Milpitas), two birds; January 26, 1929, Los Altos country club (San Antonio Township), two birds; January 26, 1929, Los Altos hills (two or three miles south of Los Altos), three birds; August 19, 1929, over Stanford Stadium, one bird; October 26, 1929, Trimble Road and North First Street, San Jose, one bird; January 25, 1930, Arroyo Calero, one bird.

Paucity of records for the spring and summer of 1929 is accountable for, in part, by the absence of the writer from the state from mid-June until September and also because some Kite-favored territory was not visited. On the other hand, absence of Kite records in the region between San Jose and the Bay is unaccountable, for many trips were made into this region. Mr. J. A. Slatore informs the writer that Kites were present on his ranch during the summer of 1929 and probably nested there.

With two or three exceptions the above records have not been previously published and their inclusion here presents two points of interest: first, the regions of the Valley that the Kites frequent and, secondly, an opportunity for an estimate of the total number of birds now in the Valley.

To one acquainted with Santa Clara Valley the rather numerous records above (with one or two exceptions) quickly become associated with four regions, each distinctly separated from the other. These are: 1, Los Altos and Palo Alto in the northwest corner; 2, San Jose and Alviso in the north central; 3, Evergreen and Silver Creek Hills in the center; and 4, the upper regions of Arroyo Calero and Llagas Valley (Las Uvas Township) toward the southwest corner. Excepting only region number 2, these are all areas of rolling hills with sparse coverings of scattered trees. Region number 2 is lower valley of diversified farming with many orchards, two creek beds with their typical borders of box-elders, cottonwoods, willows and occasional eucalyptus, all terminating in the salicornia marshes of San Francisco Bay. Kites hunt over hill and surrounding valley fringe and, in region number 2, over orchard, meadow, creek and marsh.

Field work from the State College at San Jose, covering practically the entire Valley at frequent intervals, has disclosed no other areas than these listed above.

<sup>1</sup> For records prior to April 18, 1928, the writer is indebted to Miss Emily Smith.

Let us estimate that an average of four pairs of Kites (too high an estimate for some, too low, perhaps, for others) frequents each. We have then sixteen pairs of Kites in this entire valley. Twenty pairs, forty birds, would, I feel convinced, account for every Kite from Gilroy to the Bay and from Mount Hamilton to the summit of the Santa Cruz Mountains.

The records have one other point of minor interest. The birds have been recorded from the same region during all seasons of the year, thus showing their resident nature. Indeed, it is apparent that they probably do not venture over territory more than a few miles in diameter in an entire lifetime. In the light of this knowledge the naïve nature of the remark by Taylor (1889) that on February 19, 1889, he took a walk into the country near San Jose to see if the White-tailed Kite "had yet arrived from the south" becomes at once apparent.

**The future of the White-tailed Kite.** An account of a beautiful, impressive and characterful bird would not be complete did it not pause, in the last paragraphs, to consider for a moment the future of that bird. Whether the Kite has been, is now, or soon will be on the verge of extermination is a question of intense interest to every lover of birds. To one who has watched them by the hour, has, in fact, lived with them, their future is more than a matter of interest—it is a matter of intense emotion.

And yet one cannot predict the future except upon the evidence and statistics of the past. With the Kite, as with all birds, these records of the past are, at best, vague and questionable. Was the Kite ever numerous? If so, when? If the Kite has been seriously reduced in numbers within recent years, how? If the Kite is recovering at present, where is it staging such recovery and why?

I have just two records that indicate that the Kite may once have been numerous in California. Cooper (1870) records it as "abundant" in the middle districts of California, remaining in large numbers during winter in the extensive tule marshes of the Sacramento and other valleys. The second record of numbers is that of L. Belding (Bendire, 1892) who considered it a constant and common resident near Stockton, California, he having seen as many as twenty at the same moment. Nevertheless, B. W. Evermann is quoted in the same account (Bendire, 1892) as considering it "not at all common" and he was including Santa Paula, the San Buenaventura marshes, and Santa Clara Valley. Taylor (1889), as previously noted, considered the Kite, even at that date, rare and becoming rarer about San Jose. Was the Kite common from Stockton to Sacramento and nowhere else? If these accounts are reliable and the paucity of recent records from that region any evidence, then the Kites were certainly more numerous then than now.

That the Kite has been reduced seriously is intimated by Grinnell (1914) and by Dawson (1923). Perhaps they based their statements upon the conditions in the lower San Joaquin Valley. The case for Santa Clara Valley is not so clear. Excepting the remark of Taylor (above cited) no other writer bothers with an estimate of relative numbers.

Taylor (1889) attributes destruction of the Kite to the fact that its "conspicuous and pleasing plumage with its singular trust in the kindness of man, makes it the easy prey of every careless farmer and designing pot hunter". I should, for Taylor's day, substitute the word "egg-collector" for "pot hunter". Taylor himself took two sets while he lamented the Kite's scarcity. Parkhurst (Bendire, 1892) took three sets from the region of San Jose, and Barlow (1897) took no less than nine sets from Santa Clara County, three of which were "second" sets, most destructive of all egg-collectors' loot! Grinnell (1914) is convinced that the

"present rarity" of the Kite is due to its associational preference for marshes where it is an easy target for the thoughtless gunner. The present condition in the San Joaquin-Sacramento marshes no doubt proves it. A thoughtless gunner took one of the Kites from the Slatore ranch the fall of 1928 and presented it to Mr. Slatore with a request to be told what the "funny bird" was. Mr. Slatore's answer, to one who had shot a friend of his, is unprintable. This bird was not over a marsh but in the hills.

Where the Kite is increasing in numbers is a bit difficult to say. To mention a place is to presume it was once more numerous there and evidence for that is usually merely an impression. In Santa Clara Valley as a whole I can find no evidence of change in Kite numbers. I have, however, a clear-cut record for another place. Laidlaw Williams (1929, and in a letter to the writer) records the Kite's return to the Carmel Valley where it nested in 1928, having been extirpated from the region some years before.

What the situation is in Sonoma County, for instance, where Evans (1887) found his many nests on the Russian River, the writer cannot say, nor are records sufficient to make a statement for Marin or Solano counties. Mrs. Marjorie Howell wrote me on May 4, 1929, that Kites were nest building about mid-April that year three miles east of Santa Rosa in Rincon Valley, Sonoma County. It is to be hoped that here the Kites end each year with at least the number they started with.

Our questions, then, are but partially answered. The Kite was certainly more numerous in San Joaquin and Sacramento counties forty to sixty years ago than it is now. In other regions where it was present, especially in marsh districts, undoubtedly it has been seriously reduced in numbers. The condition in hill sections inhabited by it can be but guessed at. Here it probably has suffered least. Gunners can be held chiefly accountable wherever it can be proved to have been reduced recently. Man is responsible to a less degree through change of breeding territory. The Kite, if it is recovering, is doing so because of greater protection from shooting. Where it is recovering (or at least where it is now in greatest numbers) seems to be in those hill regions where its ancient strongholds were and the Santa Clara Valley is perhaps the chief among them. Evans (1887) believed (though he did his chief collecting in Sonoma County) there were "as many in Santa Clara County as anywhere else".

What the future of the Kite will be no less than an oracle can tell. I asked Mr. W. H. Hannibal, an early settler in the region north of San Jose, a region where Kites still persist, how numerous Kites were there fifty years ago. He replied "never more than one to two pairs". Yet several Kites might nest in close proximity. Hudson (1920), though stating that the White Kites were present throughout the Argentine Republic, adds, "nowhere numerous". The problem is perhaps that of a dying species. Not man alone but Nature in general, to which the Kite has never adjusted itself for success in numbers, has marked this bird for early extinction. If we could explain what forced the Kites to nest into July, what destroyed two or three nests on the Slatore ranch (can other hawks be the fault?), what destroyed the nests Peyton (1914) and others tell of, then perhaps we could tell how Nature is working to this end.

#### SUMMARY

White-tailed Kites were found breeding, in the summer of 1928, in the Silver Creek foothills of the Mount Hamilton Range, Santa Clara County, California.

The three nesting trees observed formed a scalene triangle 320 by 200 by 175 yards, thus placing the nests, for raptorial birds, unusually near one another.

The nesting trees were valley oaks (*Quercus lobata*) and a coast live oak (*Quercus agrifolia*). The heights of two nests were estimated to be about thirty feet, the third, measured, was fifty-nine feet above the ground.

The nests were loose piles of dead sticks in the uppermost branches. Linings were chiefly of straw.

The nests were first observed on June 3, 1928. A resume of the literature, giving nesting dates, indicates that these were probably second broods, certainly second or third sets.

Nest number 1 was destroyed by unknown agencies. The eggs of nest number 2 were incubated for a known period of thirty-one days, but the young were destroyed shortly after hatching. Nest number 3 was vacated by its nestlings between July 31 and August 10. The young of this nest presented a great discrepancy in development, whether from differences in age or differences in amount of feeding is not known.

Adult Kites have unique habits of hovering, leg-dangling and wing posture in flight.

Adult Kites persistently fight large hawks. It is suggested that these hawks may, because the nest of the Kite is exposed above, be responsible in part for destruction of nestling Kites.

The Kite procures prey by erratic harrier methods at a height intermediate between those customary for Marsh Hawk and Buteos. The prey is secured by stooping with legs dangling and wings lifted over the back.

Adult Kites have no elaborate means of nest protection. The incubating bird usually abandons the nest when a human intruder is from seventy-five to one hundred yards distant. Males and females (?) then fly about with legs dangling and with mild distress notes.

The calls and notes of the Kite are three in number, expressing various degrees of solicitude: *chip*, *chip*, or *kēēp*, *kēēp*, *krēē-ēēk*, and *kēē-rāk*.

The nestlings have the usual self-protective reactions of raptorial birds. This is an "intimidation display" consisting of three stages: 1, spreading wings and opening mouth; 2, thrusting forward of the claws and dropping upon the tail; 3, dropping over on the back and presenting the talons.

One note of the nestling is a *krēē-ēēk*, like that of the adults, and the intimidation display is accompanied by a Barn Owl-like scream.

With one or two exceptions, references in the literature are, with respect to the food of the Kite, unconvincing. The writer found a squirrel (*Citellus beecheyi*) beneath the nest and *Microtus* skulls in the pellets.

In Santa Clara Valley there are four known stations frequented by White-tailed Kites. Three of these are in the foothills and one in the lower valley not far from the Bay.

It is estimated that between sixteen and twenty birds constitute the entire population of Kites in the Santa Clara Valley. There is evidence, from the literature, that the Santa Clara Valley has as many or more than any other equivalent region in California. Counties immediately north of San Francisco Bay are the next most abundantly inhabited, it appears.

The literature indicates that the Kite was once more numerous than now in the San Joaquin and Sacramento valleys. The situation for other regions is not clear.

Gunners, more than alteration of breeding territories by man, are believed to have caused reduction of Kites where such can be shown to have occurred.

This Kite is probably a dying species, never within historical times having predominated as such raptorial birds as the Desert Sparrow Hawk or Red-tailed Hawk for instance.

The causes for lack of the species' success are: 1, lack of proper protective responses; 2, probably the exposed nest; 3, possibly also poorly developed food-getting habits; 4, other causes not now understood. It has a range of nesting habitats sufficiently versatile to eliminate this as an important factor in its biological economy.

The White-tailed Kite may persist for a long period, even increase slightly, under proper protection.

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*San Jose State College, San Jose, California, March 6, 1930.*

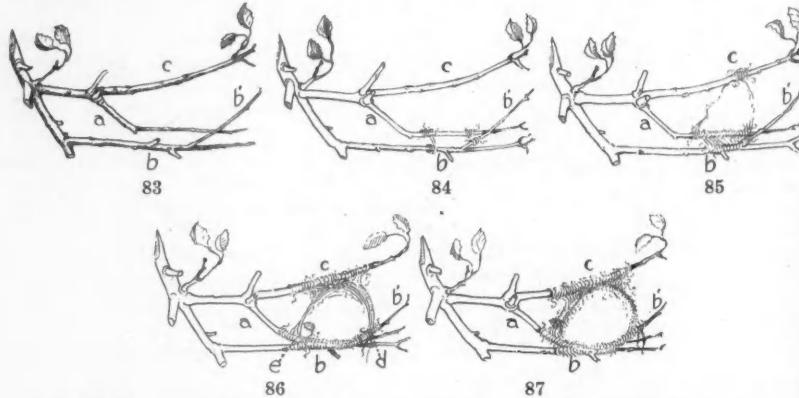
## THE CONSTRUCTION OF A HUTTON VIREO'S NEST

WITH FIVE ILLUSTRATIONS

By AMELIA S. ALLEN

The Hutton Vireo (*Vireo huttoni*) is a permanent resident in the San Francisco Bay region but is comparatively rare in the neighborhood of Berkeley. It was therefore a decidedly interesting event when a pair began building a nest in the terminal twigs of a live oak situated in such a way that the site was within six feet of one of our windows. The notes of these birds had been frequently heard for two or three days immediately preceding March 24, 1930, when the pair was first seen.

Weather was very warm during these days (max. 85°), and on March 23 a light east wind cleared the air of every vestige of fog. Even a human being might easily have been deceived into believing that he was basking in the Sonoran zone, until March 28 when a chilly ocean fog brought him back to the proper Transition frame of mind. It was then that the vireos apparently repented of their rash venture and departed.



Figs. 83-87. SUCCESSIVE STAGES IN NEST-BUILDING BY THE HUTTON VIREO. SEE ACCOMPANYING TEXT.

But in spite of the fact that the nest was never completed, a few observations regarding its structure and the technique of the builders may be worth recording, since most of the published accounts of the nesting of vireos begin with the feeding of the young.

The site selected was about twenty-five feet from the ground on the northwest side of a tree which stands on a north-facing cañon slope. The sun shone on the site during the early afternoon and it was during those hours that most of the building was done. Though I was awake at dawn each morning I failed to hear a vireo note before eight o'clock. Whenever the birds were seen at the nest, which was at rather long intervals, their actions seemed deliberate and their work, as a rule, unhurried.

The arrangement of twigs in the site selected is shown in figure 83. The new leaves on the twigs were less than half grown. It was on twig 'a' that the bird was first seen at 2:50 p. m. on March 24. When it came again at 3 p. m. and alighted

on the same twig, my suspicions were aroused. At its third appearance it seemed to bind some fine material to twig *a*, then flew into the next tree. Immediately the mate came and bound more material to the same twig, and by using glasses I could see a covering of cobweb on this twig. At 3:20 the pair came again. One carried cobweb in its beak which it deposited on twig *b*, drawing it across from there to twig *a* (fig. 84). After she left, the mate came, calling *swee-eet, swee-eet*, but made a hasty inspection only. At 4:03 a bird giving a harsh note came and deposited a bunch of cobweb on twig *b'*, called loudly several times and left. At 4:07 a bird came, took a hasty look and flew without giving a call.

March 25 dawned clear and warm. More cobweb had been deposited after my last observation on the previous afternoon. I saw a bird at the nest site at 9:15 a. m. and again at 10:40. It was not possible for me to watch continuously, but I could listen and I heard very few calls. At 1:25 p. m. I heard the sharp call being given continuously, so I turned my glasses on the nest. One bird came but almost immediately flew away. At 1:30 a bird alighted on twig *c*, reached across to twig *a*, seized some of the cobweb in its beak and pulled it across to twig *c*, holding it there with the left foot. It then drew another bit across from a lower point on twig *a*, brought it to the same point, drew it around under and up with the bill and fastened the two strands to the upper twig (fig. 85).

Warm weather continued on March 26 with a light breeze from the east. At 8:10 a. m., I first heard the birds. One call was the *swee-eet*, typical song of the Hutton Vireo, the other *mee-me-e-e*, common alarm note used by other vireos as well as the Hutton. Then the harsh note sometimes used by the Hutton was heard. At 8:25 a bird came to the nest, but a telephone call prevented me from seeing what was done. Between 9 a. m. and 10:15, when I watched continuously, nothing happened. More material had been added so that the outline of an upper rim for the future nest could be seen. The cobweb on twig *c* was loose but that on twig *a* was firmly felted and bound twigs *b* and *b'* closely to twig *a*. Some shreds of fine green moss were visible, on twigs *b'* and *c*. At 10:55 I happened to be near the window again and saw the pair in the next tree. One bird flew across to the nest and hurriedly pulled cobweb to the left from a dense felting at *d* and another bit toward the right at *e* (fig. 86). This bird flew, and immediately the other perched on twig *c* and very deliberately tucked in a few ends, binding them more firmly. At eleven o'clock a few more touches were given to the rim.

Quite a strong east wind blew during the night following and continued intermittently during the morning of March 27. I watched continuously much of the time but saw nothing of the birds. The wind had blown many blossoms from the oaks and these had lodged in the cobweb, making the whole look more dense than before. A coarse white thread was conspicuous at *d* and a dead leaf at *e*. An open webbing sagged from the rim and its supports. That the birds had not yet given up their undertaking is shown by the fact that they were seen at the nest at 1:15 p. m. We were away from home from that time until the afternoon of March 29. While we were away the weather changed. A cold fog blew in, and on our return the nest was practically unchanged (fig. 87) but deserted.

Berkeley, California, May 30, 1930.

## FILIPINO COCK FIGHTING

WITH THREE ILLUSTRATIONS

By LEON L. GARDNER

Wherever one goes in the Philippine Islands he will see the bare-footed and ragged Filipino with his pet cock (fig. 88) under his arm or squatted by the roadside or by his miserable nipa shack, training it in the essentials of fighting. This cock is his most beloved possession, the hope of his financial prosperity, the object of his unfailing devotion. Cock fighting is the national sport around which is centered the life of the community, while the cock pit is the communal gathering place. The performance of the cock in the terrifying commotion of the pit, his undaunted courage, and his response to training are so remarkable that they warrant a brief comment in these pages.



Fig. 88. THE LIGHT OF HIS LIFE.

The fighting cocks are ordinarily the pick of the native breeds although in some localities there is a strain of the Saigon chicken which is a pea combed fighter that is very game. The Red Pyle Game from the United States is much prized but is extremely susceptible to the endemic diseases of this region. The best known and most desired game cocks in these Islands are the "Banaba", a black-breasted red cock with black beak, shanks, and toes, that originates from southern Luzon. Good fighters, those that have won a number of contests, sell for remarkably high prices, considering the impoverishment of the average Filipino.

The selected cock is separated from the brood and carefully nurtured. He is fed daily once only, and then on unhusked rice. At the age of four months and thereafter he is kept in confinement, tethered by a peg and cord or in the arms of his devoted owner and trainer. At this same age the training commences; but the cock is not entered in any contests until it is at least a year old. It is taught by handling, stroking, and carrying to trust its trainer so that, no matter how be-

wildering the noise and confusion, it will stand perfectly still and allow itself to be caught and picked up. It is a common sight to see such cocks being carried by the owner while the bird lies contentedly on the palm of the hand, legs dangling and head erect and defiant, absolutely fearless and trusting.

To develop the thigh muscles so that a swift leap and powerful blow will be possible the legs are massaged frequently. The abdomen and pectoral muscles are also rubbed so that the skin of these parts becomes a bright red—hence the term “the pink of condition”. The cock is also made to dance by being teetered up and down on the ground, which strengthens the toes. Another thigh developing exercise is to press the cock strongly to the ground from which position it is allowed to scramble to freedom. Finally, twice a week or even daily the rooster is given a cold sponge and massage. The comb is usually cut off so as to allow no hold for the adversary.

Combativeness and skill are developed by means of trial bouts. Two cocks are brought face to face but held securely by their tails. As they rush at each other they are tugged back by the trainers and so this goes on, the cocks straining to engage in combat and the trainers pulling them back by their tails. Occasionally a trial go is permitted and at such times careful watch is kept of the tactics employed by the cock. The best fighters are those that leap quickly and strike out viciously with the legs. Some cocks are shrewd and wait until the opponent has expended his leap after which they will close in and kill him. They are often expert at dodging and skulking under and away from the opponent and then suddenly turning and leaping upon him. An expert fighter wins many bouts and can be counted upon to kill his opponent unless the latter has equal ability. Many cocks will leap only at the moment of conflict and fail to strike with the legs, others are slow moving, and still others are witless and fail to take advantage of breaks. These are, of course, all undesirable traits; and the cock is apt to go into a pot pie before he enters a contest and is sure to anyway at the termination of his first battle which he never survives.

The cock pit is usually a raised platform, perhaps thirty feet in diameter, about the height of a man's shoulders from the ground. The common crowd gathers around this. Over their heads tiers of seats are constructed above the pit in the form of an amphitheater to which special admission is charged.

It is well worth while to visit one of these pits. The bouts are fought on every Sunday and holiday. During the day all traffic is headed in the direction of the pit so that no one need ever inquire the direction. Women in bright colored dresses with huge baskets filled with produce balanced on their heads, children carrying filthy fly-blown pork on dirty cords, the young bucks of the town with gaudy shirts the tails of which always hang outside the trousers, two-wheeled carts drawn by diminutive sweating ponies and loaded with mobs of people, pigs, sugar cane, and produce, the cock trainers with the lights of their lives tucked carefully under their arms, the men of the town, many in bright red jeans with a few pesos burning holes in their pockets, all are headed for the day at the pitside.

A few centavos gain admission through the fence that surrounds the whole enclosure. Vendors are squatted on the ground on every side displaying all kinds of wares from spectacles and diamond rings (imitation) to cloth and rotten fish. The air reeks with unimaginable odors. Fighting stallions, squealing pigs, barking dogs, howling children, chattering women, yelling betters, and crowing cocks set up a bedlam of ear splitting sound. There is a fascination about all of this activity

and it is little wonder that to those whose meager lives consist of endless days in the paddy fields and three bowls of rice each day this should represent the acme of life's pleasures.

Ahead is the cock pit. Here the trainers are pairing their cocks for the fights. The feathers of the thighs are plucked out to make the cock look thinner than he really is; but not to be fooled by this each man tries the weight of the opposing cock and if there is any great disparity endeavors to gain an advantage by an agreement to shift the gaff to the right leg of the larger rooster. The left leg is the one with which the main blow is struck, so that the gaff is always on this leg unless the rooster is handicapped. Another little maneuver that insures success to the challenger, if he is fortunate enough to consummate it, is to feed a grain of corn filled with opium to the opposition!

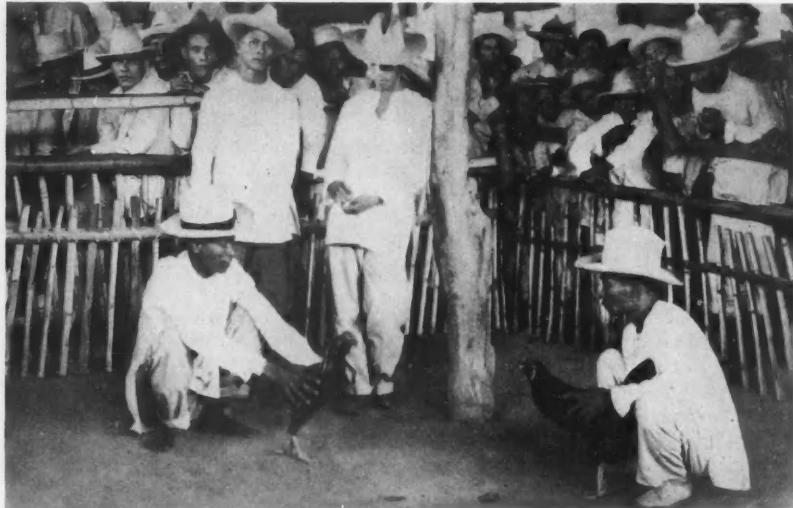


Fig. 89. THE NATIONAL PASTIME.

Courtesy of Denniston's Inc., Manila.

One peso admits to the amphitheater where a milling, sweating, jostling crowd gazes down on the contests. Two cocks are brought in, the gaffs on their left legs sheathed in leather scabbards. These gaffs are about two and one-half to three inches long, slightly curved with the concavity upward, razor-sharp on the upper surface, and needle pointed. They are capable of inflicting severe wounds so that there is always a wild scramble to avoid the fighting cocks when they are engaged in conflict. They are adjusted at an angle as is the normal spur. The cocks strut about proudly, crowing and indifferent to each other's presence. Pandemonium breaks loose, such mad yelling and howling, voices shrill with blood lust, wild with avarice and hope as bets are hurled about the amphitheater. One cock picks at his gaff and steps around with jerky gait. The gaff irritates him and both cocks are withdrawn while the ferocious yelling dies down to a muttering undertone.

Two more cocks are brought in and the shouting swells to its former fury. The referee takes the hat from one owner's head signifying that he has not the money

to meet the full bet of the challenger and inviting backing from the crowd. This is forthcoming, usually at odds. Money is hurled into the pit where it lies or is picked up and carried to the bookmaker's table. Men shriek the odds across the pit, waving their arms and fingers as they lay side bets. At important fights such as inter-provincial contests as much as 50,000 pesos (\$25,000) are wagered, a truly staggering sum in this land of poverty where men will stake their all on one leap of a fighting cock.

The noise dies down as the bets are laid. The referee, whose duty it is to give the signal for the combat and who is "going to make for the cocks a sentence"<sup>1</sup> (adjudge the winner in case of doubt) orders the scabbards removed. Both cocks are picked up and make no protest in spite of the terrific confusion. After the knives are bared each cock is allowed to peck the other three times on the side of the head which stimulates their fighting instincts and incidentally gives a chance for a little

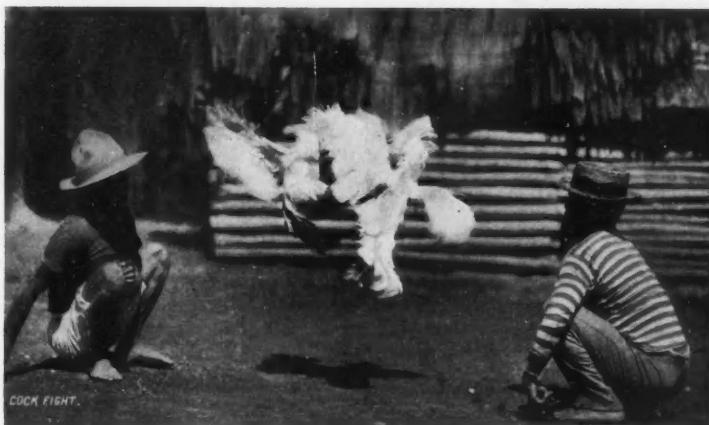


Fig. 90. THE GAFFS SINK HOME.

Courtesy of Denniston's Inc., Manila.

foul play by smearing poison on the area that is to be pecked. The owners now withdraw a few paces, each knowing the characteristics of his cock and seeking to give it the advantage (fig. 89). Perhaps one cock does best when released at a distance, from which point it will hurl itself like a thunderbolt at its enemy. The second cock, on the other hand, may be a low fighter which seeks to feint until the other is off its guard and then slash it with the gaff. In any event, when the referee gives the signal both cocks are released. For a moment they ignore each other, stepping warily about. Then they come face to face, the neck feathers spread out fanwise and their heads bob up and down. The crowd is yelling furiously while the cocks maneuver for an opening. Suddenly they leap high into the air and meet in a flurry of feathers (fig. 90) as the gaffs sink home and a shrill yell of triumph breaks from the crowd. One cock has already received his death blow and jets of crimson blood spurt out and stain the earthen floor. They may leap again a number

<sup>1</sup> My informant is my Filipino mess sergeant who owns a cock pit and has trained cocks for years.

of times, one cock lagging in energy as his life flickers out. Game to the end, he faces his foe struggling to keep his feet until death whirls him out.

The winning cock is the one that kills his opponent, except in such cases when one or the other runs away, an uncommon occurrence. In that case the aggressor is the winner even though mortally wounded and even though he sinks in death as the other turns to run.

*Camp John Hay, Mountain Province, P. I., January 30, 1930.*

## EGGS OF XANTUS AND CRAVERI MURRELETS

WITH ONE ILLUSTRATION

By GRIFFING BANCROFT

This paper is a report upon an examination of one hundred eggs of each of two species of murrelets. Its purpose is to describe the shells, to compare the two series, and, from the data so obtained, to study the relationships between the birds themselves.

A secondary motive actuated the investigation. An examination was made into the probable results of a research somewhat more elaborate than conventional measurements. As the methods here adopted developed they demonstrated that they could be made to show, negatively, that certain geographical groups of similar birds do not interchange matings with each other. The possibilities of positive inferences and of approximating degrees of relationship warrant the accumulation of further data. This paper is therefore drawn in a form susceptible of indefinite expansion and its scope is limited by practical considerations. The importance of laying a foundation for future extension seems to me to overshadow the objective itself.

**Nesting.** There are some facts connected with the laying of the eggs which have a direct bearing on the findings. These murrelets are insular breeders. Their instinct is to nest at the end of a natural burrow or crevice. The preference is for a recess two or three feet deep and not much larger in diameter than themselves—one which excludes all light and allows only a frontal approach. *Endomychura hypoleuca* breeds in the Pacific; *Endomychura craveri* in the Gulf of California.

Either from preference or because of the environment there exist minor differences in the nesting habits of the two races. *Craveri* are the more consistent. I have met with no exceptions to the rule that they lay in a burrow or crevice, and in the dark, and that they do nothing to improve the nest. Their eggs rest on rocks or pebbles or hard earth. On the other hand incubating Xantus often so expose themselves as to be visible to the passer-by. They frequently occupy caves and pot-holes and, if these have sandy floors, they scrape shallow depressions. It is not at all unusual to find their eggs above the surface, under thick vegetation. There is a suggested approach towards *Synthliboramphus*.

**Determinations.** Every egg was measured for length and width. The shells, dry and empty, were weighed individually. Each was then filled with distilled water and weighed twice, once in air and once suspended in water. Corrections for barometric pressure and for temperature were not considered advisable, and beverage distilled water was used because it is generally available.

**Technique.** Aside from the customary precautions incidental to delicate weighing, this is largely a contest with internal air bubbles. The best results follow if the shells are kept submerged as they are being filled and if they are allowed to rest, holes uppermost, for several days. Repetitions until duplicated figures agree with originals are an essential test. In my own case it was noticeable that the figures became more consistent as my experience increased.

**Size.**

Xantus, average 34.88 cc.  
Craveri, average 32.93 cc.

These figures are intended to represent Xantus and Craveri eggs in general and not merely those of the series. For that reason I have dropped all but two of the calculated decimals. Even as it is, the last one is not significant and is retained only because it qualifies the other. The question of how many decimals to use is

delicate and is answered more through judgment than through mathematics. It is my intention, in all cases, that the penult shall be fixed. That is, I do not intend to pass the point where the last figure but one would be altered a full unit

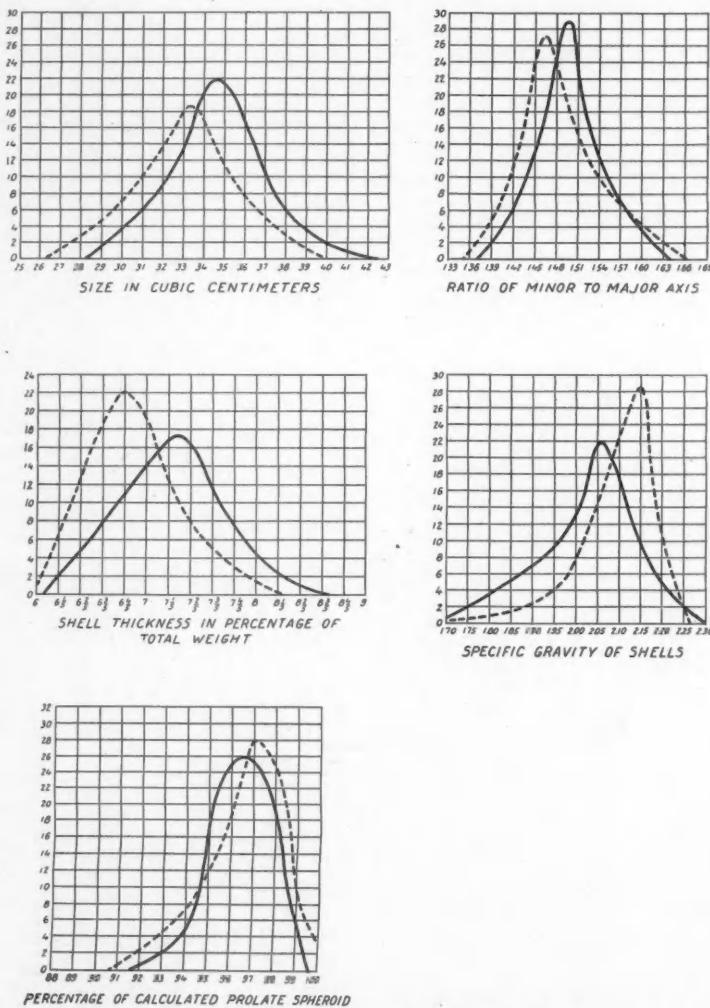


Fig. 91. VARIATIONS PLOTTED FOR EGGS OF XANTUS MURRELET (in solid lines) AND CRAVERI MURRELET (in broken lines).

by any increase in the number of specimens on which it is based. If my surmise is correct in the case before us then we may regard as proven that the average external volume of eggs of the Craveri, for instance, is 32.9 cc. We may suspect that it

approaches 32.93 more closely than 32.90 or 32.96, but on that refinement we have no certainty.

The distribution of the sizes is expressed with graphs<sup>1</sup> (fig. 91) in preference to the more customary use of extremes. The object is to minimize the influence of abnormalities. This work is predicated on the belief that, through averages, we can neutralize sports and technical errors and evolve normal types from a mass of irregularities, variations, and inconsistencies. Whatever can be learned by such means obviously is to be found in the centers, not on the edges, of the graphs.

The designation of sizes in cubic centimeters is a far better practice than the use of axial dimensions. It gives the values, in one set of figures, with an accuracy limited only by the patience of the observer. It forms a definite base both for the drawing of conclusions and for further calculations. So greatly am I impressed with its advantages that were this paper to result in nothing more than the adoption of cubic centimeters as the standard of size I would feel well repaid for the work.

The difference in the average volumes of the eggs of the two series is well marked and distinctive. It has been shown to be constant and therefore it precludes any present interchange of blood between the birds themselves. If the two races were not breeding as separate entities the differentiating characteristic could not maintain its distinctive inheritance. On the other hand the size of the egg could be, and most probably is, determined by the size of the mother. That, in turn, is subject to evolutionary selection and could therefore be altered in a biologically short space of time. So while we may be sure that Xantus and Craveri are now breeding independently of each other, the relative sizes of their eggs are not indicative of the length of the separation.

**Axial dimensions.** In deference to custom I give these in the conventional form.

Xantus, average 53.73 x 35.84 mm.  
Craveri, average 52.37 x 35.21 mm.

Extremes. Xantus, 57.8 x 35.4, 57.0 x 38.0, 49.3 x 34.2, 53.0 x 34.0.  
Craveri, 57.0 x 35.2, 49.0 x 32.6, 54.8 x 38.1

**Shape.** Of the possible mathematical expressions of shape I have selected two. One is the ratio between the major and the minor axes.<sup>2</sup> It represents the length of the shell in terms of the width.

Axial ratio of Xantus, average 1.499  
Axial ratio of Craveri, average 1.488

If we calculate the cubic contents of a prolate spheroid having axes the same as those of a given egg, and if we then ascertain the actual size of that egg, we can determine its percentage of the spheroid.<sup>3</sup> These percentages vary with the degree to which the egg is rounded and more particularly with the average areas of the cross-sections. They represent shape in terms of fullness of form.

<sup>1</sup> Data for graph of sizes. Xantus, 29=1; 30=2; 31=1; 32=10; 33=10; 34=22; 35=12; 36=19; 37=11; 38=6; 39=2; 40=2; 42=1. Total = 100. Craveri, 27=2; 28=4; 29=3; 30=10; 31=9; 32=10; 33=18; 34=17; 35=14; 36=7; 37=5; 38=1. Total = 100.

<sup>2</sup> Data for graph of axial ratios. Xantus, 1.39=1; 1.41=4; 1.43=3; 1.44=5; 1.45=3; 1.46=5; 1.47=9; 1.48=12; 1.49=8; 1.50=10; 1.51=4; 1.52=7; 1.53=7; 1.54=5; 1.55=3; 1.56=2; 1.57=2; 1.58=1; 1.59=1; 1.60=8; 1.61=1; 1.62=1; 1.63=1. Total = 100. Craveri, 1.36=1; 1.39=1; 1.40=1; 1.41=3; 1.42=4; 1.43=2; 1.44=11; 1.45=8; 1.46=8; 1.47=8; 1.48=5; 1.49=8; 1.50=8; 1.51=6; 1.52=5; 1.53=2; 1.54=5; 1.55=2; 1.56=5; 1.57=2; 1.58=1; 1.59=1; 1.60=8; 1.61=1; 1.62=1; 1.63=1. Total = 100.

<sup>3</sup> Data for graph of spheroidal percentages. Xantus, 92=1; 93=2; 94=3; 95=19; 96=25; 97=25; 98=19; 99=6. Total = 100. Craveri, 91=1; 92=3; 93=4; 94=2; 95=17; 96=15; 97=28; 98=17; 99=10; 100=3. Total = 100.

Xantus, average 96.46%  
 Craveri, average 96.64%

The differences in these shapes are relatively small. The axial ratio for horned owls, for instance, is 1.20 to 1.25, for cormorants about 1.80. Percentages of prolate spheroids will probably prove to be about 90 for murres and 97 for auklets. Considering the extent of the possible range and the fluctuations as the tabulations were compiled as well as my rather crude technique, I am forced to the conclusion that, while there probably exists a slight difference in ellipticity, none has been proven as to the other standard of shape. The evidence demonstrates, in so far as form is concerned, that communal inheritances are strongly predominant and possibly coincident.

**Surface.** There are no visible distinctions in the textures of the shells of the two species. The surfaces are smooth and glossy. If we were to arrange the eggs of North American birds in arbitrary classes with reference either to frictional resistance or to reflection of light, those of *Endomychura* would be placed but a few groups below the smoothest or the brightest, as the case might be.

**Ground color.** The determinations were based on Ridgway's "Color Standards and Color Nomenclature." Every egg was referred to the printed color which it most closely resembles. The results, of course, were approximations. For instance twelve eggs are listed as "white". In each of them a tinge is readily perceptible and yet every one more closely approaches pure white than any color that Ridgway gives.

	Xantus	Craveri
White	3	9
Pale Olive Buff	25	44
Pale Smoke Gray	10	7
Tilleul Buff	5	8
Olive Buff	17	18
Smoke Gray	3	3
Vinaceous Buff	5	4
Avellaneous	11	4
Deep Olive Buff	13	3
Buffy Brown	6	0
Army Brown	2	0
Total	100	100

**Pigmentation.** The markings are virtually confined to two colors and both are to be found on every egg. There is the basic Light Olive Gray which occasionally shades into Smoke Gray. Superimposed upon it and dominating the coloration of the entire collection is Bone Brown. That, too, has its modifications in occasional Olive Brown, Buffy Brown, or Isabella Color.

**Markings.** The table below refers to the relative proportions of the surfaces which are covered with markings. The references in this and in the succeeding table are to the bodies of the eggs as distinguished from the wreaths about the larger ends.

	Xantus	Craveri
Almost plain	8	9
Lightly marked	5	19
Medium	16	39
Well marked	24	24
Heavily marked	47	9
Total	100	100

The markings themselves fall into five classes. As all of the designs are present, in varying degrees, on every egg the tabulation is based on predominating characteristics.

	Xantus	Craveri
Streaks	2	0
Fine dots	8	14
Spots	13	28
Small blotches	42	39
Medium blotches	35	19
Total	100	100

Within my experience every egg of either murrelet has a tendency to gather the markings about the larger end. Usually a distinct wreath is formed. A tabulation of these wreaths showed them to be about equally divided between suggested, decided, medium, and heavy, and to be virtually the same for both Xantus and Craveri.

With the two hundred eggs spread upon the table it was clear that, individually, the eggs of the two species were not distinguishable. Yet the groups were distinctive. As would be surmised from the tables the eggs of Xantus show the wider range in color and markings. In the aggregate they are more bold, more brilliant and more striking. Contrasts are greater. The importance of these facts is emphasized because of their bearing on the relative antiquity of the two races. It should be noted, too, that they are directly opposed to the status of plumages. The following statement by van Rossem (Condor, XXVIII, 1926, pp. 80-83) is fully supported by my own observation. "*Craverii* is thus seen to be a highly variable species, in the case of the newly hatched young as well as in adults, while *hypoleucus* is stable and exhibits little or no variation."

It is safe to assert that, at least during the present geological era, neither the pigmentation itself nor its design has exerted any influence on the probabilities of the survival of the chick. Therefore it is to Mendel rather than to Darwin that we must turn for an interpretation of the color differences. Of themselves they throw no light on antiquity because they have come about, not through gradual change, but as the direct result of one of, or, more probably, a series of, the little understood mutations. They are manifestations of pure heredity, and as such demonstrate at once close relationships and clear lines of cleavage.

**Shell weights.** It must be understood that in all references to weights of shells, membranes are included. There seems to be no feasible means of removing the lining without destroying the specimen. Sometimes the membrane comes out during preparation. Its presence or absence is averaged or neutralized and has little effect on the comparative value of the final figures.

Our interest in the thickness of the shell is purely relative. In order to compare eggs of various sizes the expression adopted is the proportionate weights of the shell when empty and when filled with distilled water. The weight of the shell is given as a percentage of the whole.<sup>4</sup>

Xantus, average 7.22%  
Craveri, average 6.82%

The specific gravity of the shells is, of course, subject to the same qualifications as the weight.<sup>5</sup>

<sup>4</sup> Data for graph of shell percentages. Xantus, 6.2=2; 6.4=6; 6.6=7; 6.8=12; 7.0=13; 7.2=17; 7.4=16; 7.6=9; 7.8=11; 8.0=2; 8.2=2; 8.4=2; 8.6=1. Total = 100. Craveri, 6.0=1; 6.2=7; 6.4=13; 6.6=19; 6.8=22; 7.0=17; 7.2=12; 7.4=4; 7.8=3; 8.0=1; 8.2=1. Total = 100.

<sup>5</sup> Data for graph of specific gravities. Xantus, 1.50=1; 1.55=1; 1.65=1; 1.75=2; 1.80=5; 1.85=6; 1.90=6; 1.95=8; 2.00=10; 2.05=22; 2.10=14; 2.15=13; 2.20=5; 2.25=5; 2.30=1. Total = 100. Craveri, 1.70=1; 1.80=1; 1.85=1; 1.90=4; 1.95=5; 2.00=4; 2.05=17; 2.10=24; 2.15=29; 2.20=10; 2.25=1; 2.30=1; 2.35=1; 2.50=1. Total = 100.

Xantus, average 2.02  
Craveri, average 2.10

As will be seen from the graphs the differences are quite constant. They constitute the outstanding divergence between the eggs of the two birds. Their importance impels me to support them by calculating the medians; the latter are less directly affected by technical errors.

Xantus, shell percentage 7.23; specific gravity 2.05  
Craveri, shell percentage 6.80; specific gravity 2.11

I have before me quite an array of figures on the eggs of other Pygopodes, tabulations too incomplete and fragmentary to permit publication. They include, to date, several hundred eggs and they are sufficiently extensive to prove that the overwhelming factor in determining the thickness and the specific gravity of shells is heredity. Just as protective coloration, disuse, and other suggestive contributory causes are overwhelmed by genetic relations in so far as pigmentation is concerned, so do food and temperatures and necessities fail to dislodge inheritance as the prime, if not the only, determinant of shell structure.

The extent of the variations in their shell weights, as compared with other birds whose separation of descent is more obvious, is sufficient to show that the murrelets under consideration are far more independent of each other than has been supposed. The most plausible reconciliation of the figures under this heading with those previously discussed is the theory that the communal life of these birds ceased long ago, and that, since the severance, neither has undergone much alteration.

Sets. These murrelets normally lay a clutch of two. So nearly universal is the rule that exceptions are to be looked upon with suspicion. The eggs within a set of *Endomychura* exhibit on the average a greater variation from each other in ground color than do those of any other North American bird. Of the forty-one sets in each of the series under consideration 23 Xantus and 18 Craveri (exactly one half of the total) contain eggs distinctive enough from each other to have been assigned separate shades in the color tabulation.

The two eggs of a set are always to be distinguished from each other by referring to one as having heavier and the other the more lightly tinted ground color. The relation between this fact and primogeniture is one which, with the material available, can be approached only through analogy. I assembled 24 sets of eggs of domestic pigeons in which the order of laying was known. The following table lists the characteristics of the murrelets according to the egg having the darker ground color and the pigeons according to the egg which was first laid. The numerical equivalents are the percentages of the excess of the darker or, in the case of the pigeons, the first laid egg. To illustrate, the first figure given, 42, means that in 42% of the sets of Xantus the darker of the two eggs is the larger. The last figure, 38, means that in 38% of the pigeon sets it is the first laid egg whose percentage of a true prolate spheroid is the greater.

	Xantus	Craveri	Pigeon
Size	42	22	25
% of shell	88	80	80
Sp. gr. of shell	58	47	87
Major axis	41	35	29
Minor axis	48	30	25
Axial ratio	59	43	46
% pro. sph.	51	38	38

It is quite obvious, from the tabulation, that the first laid pigeon egg normally has the heavier shell. It is also clear that exceptions are not rare enough to be regarded as sports. If the murrelet eggs follow those of the pigeons then the darker egg is normally the heavier shelled and the first laid. We can see that it is not always the heavier shelled, and the figures suggest, though they do not prove, that there are also exceptions to the rule that it is the first to be laid.

There is not sufficient variation or consistency for us to conclude other than that primogeniture and shape have little in common. In the matter of size there appears quite a tendency for the last laid egg to be the larger. The specific gravity of the shell does not, in the case of the murrelets, appear to be related either to shell thickness or to ground color. On the other hand its relation to primogeniture with the pigeons gives the most constant figure I have obtained.

The shells thicken progressively as the ground colors become darker. This is only because the darker eggs of a set have the heavier shells. *Per se* there is no relation between the weight of one and the color of the other. The fact is demonstrated by the table below, which lists the two eggs of each set in separate columns and gives the average percentage of the shells according to ground color.

Xantus		Craveri	
Darker egg	Lighter egg	Darker egg	Lighter egg
White	1=6.08	2=7.02	3=6.79
Pale Olive Buff	5=7.45	14=7.03	15=6.93
Pale Smoke Gray	4=6.99	5=6.70	2=6.52
Tilleul Buff	.....	3=7.08	4=6.82
Olive Buff	8=7.84	7=7.09	7=7.05
Smoke Gray	2=7.55	1=8.16	3=7.12
Vinaceous Buff	3=7.06	.....	3=7.41
Avellaneous	3=7.71	4=6.84	2=7.33
Deep Olive Buff	8=7.34	4=6.96	2=6.53
Buffy Brown	6=7.54	.....	.....
Army Brown	1=7.48	1=7.32	.....
Total	41=7.44	41=7.01	41=6.98
			41=6.67

**Sex.** Again I was compelled to turn to analogy among the pigeons. Fifteen pairs of juveniles were sexed. It was known in every case which bird had hatched from the first-laid egg. The results showed no relationship whatever between sex and either primogeniture, shell-thickness, or specific gravity.

Both eggs hatched male birds in	3 cases
Both eggs hatched female birds in	4 cases
The first was male, the second female, in	3 cases
The first was female, the second male, in	5 cases
Total	15

**Comparison.** In order to obtain perspective a comparison is made with eggs of the Ancient Murrelet and the Pigeon Guillemot. These birds immediately precede and succeed *Endomychura* in the A. O. U. sequence, except *Cephus columba* was preferred to *C. grylle* because of geographical juxtaposition. Only 16 eggs of the guillemot were available, but their averages are sufficiently definite for the present purpose. The figures for *Synthliboramphus antiquus* are based on 55 specimens.

The four species under consideration have the common characteristic of laying, normally, two eggs. In shell texture the Ancient Murrelet eggs closely approximate those of Xantus and Craveri, but the guillemot's are much duller and rougher. The ground color of *Cephus* is a dull bluish white; in no phase does its pigmenta-

tion resemble that of murrelets. *Synthliboramphus*, on the other hand, is typically and consistently a pale olive buff. The range of shade is small and exceptional markings rare. It is particularly noteworthy that there is no tendency to form wreaths and but a slight variation between the eggs of a set. The darker egg is the larger in 68% of the sets and has the heavier shell in 62%. In 71% of the sets the heavier shell has the greater specific gravity.

The following table indicates the determined relations between the eggs.

	Ancient Murrelet	Xantus Murrelet	Craveri Murrelet	Pigeon Guillemot
Size	44.87	34.88	32.93	52.88 cc.
% of shell	6.50	7.22	6.82	8.82 %
Axial ratio	1.605	1.499	1.488	1.436
Sp. gr. of shell	1.88	2.02	2.10	2.08
% of prolate spheroid	96.61	96.46	96.64	96.50 %

**Conclusion.** We have seen that, in shape, the eggs in the two species of *Endomychura* virtually coincide with each other. In ground-color, markings, and pigmentation there is a close parallel, with *craveri* always lagging behind. In shell thickness and in specific gravity there is clear-cut separation. The deviation from *Synthliboramphus* is impressive. From *Cephus* it is still greater. Resemblance in one case is virtually confined to the surface of the shell and in the other to shape.

Of course, at some period these four birds had common ancestors. There is much evidence here to support the contention that the first division came between the guillemots and the murrelets and the second between *Synthliboramphus* and *Endomychura*. In color and in shell thickness the Craveri Murrelet approaches the Ancient more closely than does the Xantus. The reverse is true with regard to ellipticity and specific gravity. Size, in this connection, is relatively unimportant. If we consider as proven that the two species of *Endomychura* have not varied greatly since their separation from each other then necessarily they did not directly break away from *Synthliboramphus*. The former existence of one or more now extinct forms is necessary to complete the chain.

It does not follow, in this particular case, that the evidence has thrown any new light on an old subject, nor would it be safe, in a preliminary survey, to carry conjecture farther. Nevertheless I believe it has been shown that physical properties of egg shells are entitled to consideration in any scheme of avian classification. I believe it is safe to go farther and to maintain that, if egg data were assembled with the conscientious thoroughness that has been accorded other characteristics, they would assume a position of prime importance. They are our oldest manifestation of heredity. Long after the selective processes induced by the struggle for existence have brought about anatomical modifications in the structure of the birds we may expect to find the eggs unaltered. Except in size alone there simply exists no reason why they should change.

**Acknowledgements.** Appreciation is due to many friends who have aided with advice, especially to Miss Mildred R. Jackson for color determination, to Mr. Laurence M. Huey and Mr. Nelson K. Carpenter for the loan of specimens, and to Mr. R. R. Staley for checking the pigeons.

*San Diego, California, November 25, 1929.*

## NESTING OF THE TIMBERLINE SPARROW

WITH ONE ILLUSTRATION

By HARRY S. SWARTH

In the summer of 1924, the writer, in the employ of the University of California Museum of Vertebrate Zoology, made a first visit to the Atlin region, northern British Columbia. There, Major Allan Brooks and I, collecting together, discovered the bird that we later named the Timberline Sparrow (*Spizella taverneri*) (see *Condor*, xxvii, 1925, p. 67). The species was first encountered July 8, near the summit of Monarch Mountain, some three miles south of the town of Atlin. A pair of the birds was flushed by Brooks, recognized by him as different from anything we had thus far seen in the region, and, with some difficulty, he shot one of the pair. That particular mountain top was a favorite collecting ground, frequently visited by us during the next three months, but we saw no more Timberline Sparrows there, which seems rather curious in light of my experiences in a subsequent year.



Fig. 92. NEST SITE OF TIMBERLINE SPARROW. THE FARTHER OF THE TWO BALSAMS (about 10 feet high) WAS THE SINGING PERCH OF THE MALE. THE NEST WAS ABOUT 20 FEET FROM THE TREE.

Later in that season a series was collected at another point.

My second visit to Atlin was on behalf of the California Academy of Sciences. We arrived there on June 17, 1929, and on June 22 I made a first climb of Monarch Mountain. Soon after reaching the series of benches and hollows that, at about 4500 feet elevation, surround the rocky summit of the mountain (fig. 92), I began to hear a fine, trilling song that was unfamiliar to me, and that I decided must come from the Timberline Sparrow. A singing male, shot a few minutes later, verified this surmise, and from then on I heard many others. It was a cicada-like trill, with many interpolations suggestive of a canary's song, and, as with the canary, it was long sustained. There seemed to be a fairly regular sequence of trills and stops,

but it was not a short, definite and unvaried song, as with the Golden-crowned and Gambel sparrows. The birds were singing on all sides, and they continued until late afternoon, when there was a rather sudden cessation.

It was evident that singing males were occupying perches in fairly close proximity, a bird, perhaps, to every five or six acres, where conditions were favorable. They were wary, and generally flew before they could be closely approached, but always moved about within a rather short radius, unwilling to be driven far afield. For each singing male it seemed likely that there was a mate upon a nest near-by, but even so, with several acres of low tangled bushes to be searched, the chances of finding one did not seem very bright, at any rate to an admittedly non-expert bird nester.

However, I began a quartering of the territory surrounding each of several singing males, tramping back and forth through the tangles of birch bush, which here lay close to the ground. This was continued for some time without success, but finally a small bird darted out, not more than fifteen feet away but to one side, out of my direct line of vision. Search of the thick shrubbery was attempted, but given up as hopeless in lack of a more exact center as a starting point; so, for the time being, I withdrew to a nearby lakelet, where I ate my lunch.

A cautious return later resulted in flushing my bird at close range from a nest with four eggs. Even then, the bird arising not more than three feet away and directly in front, I had to make careful search on hands and knees. The birch was only partly leaved out, but the closely interlaced branches made a perfect cover from above. The nest, its bottom a scant six inches from the ground, was loosely placed among the supporting vegetation, not fastened to the twigs. When the surrounding branches were cut away the nest was removed separately; it could not be kept associated with the shrubbery in which it had been placed.

The nest is constructed almost entirely of rather stiff dried grass stalks and gray shreds, apparently from the fire-weed. The lining is of fine dried grass and a few moose hairs. Average external diameter (excluding long, protruding stalks), 130 millimeters; inside diameter, about 50 mm.; inside depth, about 30 mm.

The eggs are generally similar to those of *Spizella breweri*, three sets of which are available for comparison. The ground color is microcline green (Ridgway), and, as in *breweri*, the eggs of *taverneri* are marked with small blotches and tiny spots of reddish brown. In *breweri* these markings are gathered into rings at the large end, most of the remaining surface being immaculate, while in *taverneri* there is little or no tendency toward such a ring, the markings being finer and distributed over most of the egg. Of course, larger series of both species might show this difference not to be of specific importance.

The extent of the summer habitat of the Timberline Sparrow has not been learned, or of the winter habitat either, for that matter. The species is known only from a limited area about Atlin in summer, and from the capture of a very few migrants farther south. I have not been in the summer home of the species at the time when the birds were arriving from the south, but during the nesting season and subsequently up to the time of departure I saw none below an altitude of about 3500 feet. The valley in which Atlin is located lies at about 2200 feet altitude, and the valley avifauna is to a great extent different from that of the surrounding mountains. The upper limit of any extensive growth of upright timber is at about 3500 feet; some of the higher peaks reach 6000 feet. Some bird species that are restricted to high altitudes during the breeding season appear in the lowlands in

migration, but apparently the Timberline Sparrow, as also its associate, the Golden-crowned Sparrow, "takes off" for the southland directly from the high elevations where it breeds.

The conspicuous vegetational features of the timberline habitat of the bird are found in the balsam fir (*Abies balsamifera*), a species of birch (*Betula glandulosa*), and willows (whether of one species or several I can not say).

There are, of course, a host of annuals and other low growing plants, for the mountains are ablaze with flowers during the summer; but the characteristic appearance of the region is produced by the miles of low "chaparral" formed by the birch, the scattered clumps of dwarfed or prostrate balsam, and the thickets of willow about the lakes and along the streams. In this connection the birch deserves special mention. As the sage-brush is to the Brewer Sparrow (first cousin of *taverneri*), the two almost invariably found associated together, so is the trailing birch to the Timberline Sparrow. This plant varies in growth with altitude and exposure, from a prostrate condition, easily walked over, to bushes that are waist-high, or occasionally to thickets ten feet high or more, growing generally on the more dry and gravelly slopes; and it forms to a marked extent the preferred habitat of this bird.

The Western Tree Sparrow (*Spizella monticola ochracea*), also a mountain bird of this region, though on the average at a slightly lower altitude, occurs together with the Timberline Sparrow but in different surroundings. The Tree Sparrow favors the willow thickets, on the damper ground, at least during the nesting season, so that the two species are mostly in different vegetational belts. After the young are out both species scatter more widely, but even then the Tree Sparrow occurs in the birch thickets more commonly than the Timberline Sparrow in the willows.

Early in July the male birds were still singing to some extent, though the volume of sound had lessened considerably; on July 18 a few persistent songsters were still to be heard, but it was noticeable that there were only a few so engaged. Young in streaked juvenal plumage were out of the nest by the middle of July, the post-juvenal molt was in progress the latter part of July and early in August, and birds in first winter plumage, completely acquired, were collected by the middle of August. An adult in the midst of the annual molt was shot August 6, and others in fresh winter plumage throughout, on September 1 and 5. Nearly all were gone by the end of August, and September 5 was the last date on which the species was seen.

*California Academy of Sciences, San Francisco, California, March 22, 1930.*

## FROM FIELD AND STUDY

**Owl Voices.**—The month of April, 1930, I spent at Monte Vista Ranch, which lies about fifteen miles east of San Diego, California. From the screened porch of the ranch house, where I slept, I was able, on many of the nights, to hear the voices of four kinds of owls, more than I had heretofore ever heard in a single location.

The Barn Owl (*Tyto alba pratincola*) was the first afield. Still plainly visible in the dusk and looking surprisingly large as it skimmed close over the roof, it would begin its hunt with a series of almost startling screams. The syllables *sreek, sreek, tsik, tsik, tsik, sikka, sikka*, convey some impression of the staccato cry, in which sibilant sounds predominated. These hissing squeals were characteristic of the early evening, though they might also be heard in the night. Surely the English are wise in giving to their Barn Owl the popular name of Screech Owl, as contrasted with the American owl which bears this misnomer.

How the word "screech" could ever have come to be applied to the pleasant, quavering notes of *Otus asio*, it is hard to comprehend. The Southern California Screech Owl (*Otus asio quercinus*) is not common near San Diego, and until my stay at Monte Vista Ranch I had never met with it. But a night sound I heard there was immediately recognized as the voice of this bird, through my long acquaintance with eastern screech owls. East and west the quality of the notes is the same, although those of the Southern California Screech Owl I heard were usually all in one pitch, not the descending scale characteristic of the eastern form. On only one occasion did I hear a lively variation in the range. Then there was evidently some excitement, and I suspected that two birds might be involved. At all other times the "song" consisted of five notes, the last three of which formed a tremolo—*hu, hu, hu-hu-hu*. Although giving the impression of a comparatively high register, I found, when I attempted to imitate the call, that the notes were almost the lowest sound I could make by whistling. Incidentally, long periods of "answering" by me failed to attract or seemingly to interest the owl.

The Screech Owl habitually called from the eastern part of the planted grove of trees surrounding the ranch house, while in the western part of the grove could be heard the quite different hoots of a Long-eared Owl (*Asio wilsonianus*). I confess that previously my only acquaintance with the Long-eared Owl's voice had been with the mewing sounds uttered when its nest is disturbed. My identification at Monte Vista Ranch was therefore based on elimination and likelihood. It was not the hooting of a Horned Owl, with which I am familiar; and the Long-eared Owl, I know, occurs in that general locality. The bird's call, as I heard it, consisted invariably of four notes of the same register—*who-hoo, hoo, hoo*. In tempo, if the last three notes were imagined to occupy three beats, the first occupied only one beat. The tone was delightfully smooth and mellow, almost suggesting the low notes of a flute. On one occasion the owl seemed to be standing in the tree directly beside my porch; and I turned on the light, hoping for a glimpse of the performer. I could see no bird, but the hooting continued at the same interval, regardless of the sudden flood of light.

Finally, there came from the more barren ground, beyond the cultivated acres which surround the ranch house, the high, clear, disyllabic call of the Burrowing Owl (*Speotyto cunicularia hypugaea*). Ralph Hoffmann has well rendered it as *pa-pá*. This sound, it seemed, as also the calls of the other owls, was more likely to be heard prior to midnight than after; but perhaps it was the condition of the observer that was chiefly responsible!

The Barn Owl's and Burrowing Owl's voices were heard throughout April, but the notes of the Screech Owl and the Long-eared Owl ceased some time during that month. I have no record of just when they stopped; I simply became aware, toward the end of the month, that I was no longer hearing them. Possibly the demands of young that had hatched left no time for further "singing."—CLINTON G. ABBOTT, *San Diego Society of Natural History, San Diego, California, May 15, 1930.*

**The Status of the Cooper Henhawk.**—On November 10, 1855 (not "October, 1856," as given in various citations), Dr. James G. Cooper shot a hawk near Mountain View, Santa Clara County, California, that he thought was the same as the Ferruginous Rough-legs which he evidently saw quite commonly at that time in the same neighborhood (see Cooper, Pac. R. R. Repts., 12, book 2, part 3, no. 3, 1860, p. 148). The specimen in question shortly was sent East where it reached the hands of John Cassin who, in the Proceedings of the Academy of Natural Sciences of Philadelphia for October, 1856 (p. 253), made it the basis of his description of the new species *Buteo cooperi*. This bird was described repeatedly in subsequent literature, and commented upon variously. It was figured on plate XVI, accompanying volume 12 of the Pacific Railroad Reports, though not, as it proves, with any high degree of accuracy.

No other specimen entirely like the type of *Buteo cooperi* ever came to light, from California or anywhere else. One from Colorado, in the C. E. Aiken collection, Ridgway (Auk, 1, 1884, p. 253) for a time thought might belong to the same species.

Latterly, suspicion began to arise that *Buteo cooperi* was not a distinct species but a variant in the Red-tail aggregation of Buteos (see Ridgway, Auk, 2, 1885, p. 165). In the first edition of the American Ornithologists' Union Check-list of North American Birds (1886) the species was placed in the "Hypothetical" list (page 353) with the remark "Probably the light phase of *B. harlani* Aud."; the same held, with slight modifications of statement, in the second and third editions (1895, p. 329, and 1910, p. 372). The latest author to offer critical comment is Swann (Monograph Birds of Prey, 1926, p. 392, footnote) who concludes from his examination of the type that "it is an aberrant example" of *Buteo borealis calurus*.

In the course of my efforts to run down various uncertain records of California birds I have just made a study of the present case. Through the kindness of Dr. Herbert L. Friedmann, Curator of Birds, United States National Museum, I have had here at the Museum of Vertebrate Zoology for several days the type specimen of *Buteo cooperi*. It is a skin in good condition, taken down from a mount. The earliest label, in Cooper's handwriting, indicates that it was a male. Cooper's and Cassin's supposition, however, that it was "young" or "immature" does not appear to be the case, for the bird, in my estimation, is in fully adult stage of plumage. It is a big-footed Buteo, unquestionably falling within the species *borealis*; there is no structural suggestion of any possible hybrid influence from *Archibuteo* (see Baird, Brewer and Ridgway, History N. Amer. Birds, 3, 1874, p. 296). The main characters which still prevented Ridgway (Auk, 2, 1885, p. 166) from relinquishing the "claims of *Buteo cooperi* as a distinct species" are the shortness or retraction of the tibio-tarsal feathering and the "glaucous" color of the outer surfaces of the primaries.

The length of the tarsus itself shows no difference as compared with the average run of Red-tails; but it is the "bare part of tarsus in front" that shows extraordinary length as compared with most individuals of the Red-tail group, about as indicated by the figures in Ridgway's table.

In this regard, it looks to me as though in the type of *cooperi* the feathering of the flanks and tarsi had not as yet at the time of capture undergone replacement by molt, although the feathering in other tracts had; in other words, the results of wear are evident in extreme degree. Nevertheless, there is shown a greater exposure of the scaled portion of the limb segment in the type than in most Red-tails; thirteen complete transverse scutes can be made out on the right leg, eleven on the left, whereas eight to eleven is the number in the specimens of *harlani* now before me, as well as in the majority of *calurus*. This is obviously a variable feature; for now and then an example of *calurus* has twelve or even thirteen scutes showing. In no. 10643, Mus. Vert. Zool., from Mayfield, Santa Clara County, California, there are fourteen complete scutes on the right leg and twelve on the left. Therefore, in my opinion, the type of *cooperi* merely happens to show an extreme of development of sculation versus feathering on the lower leg.

The subspecies *Buteo borealis harlani* was never properly understood until Swarth's thoroughgoing study of it in 1926 (Univ. Calif. Publ. Zool., 30, pp. 105ff), wherein the characters of that race were correctly set forth and its summer and winter ranges for the first time properly outlined. Shortly afterward, Taverner (Victoria Memorial Museum, Bulletin no. 48, Biological Series no. 13, 1927, 20 pages, 3

colored plates, 1 map) presented a large amount of additional and valuable information concerning variations within the *borealis* group. His conclusions as to the pattern of subspeciation within the group were not, however, in accord with Swarth's conclusions. After reviewing both papers and especially Swarth's latest contribution (Condor, 30, 1928, p. 197), I am compelled to say that my own understanding of the facts and implications coincides exactly with that of Swarth. In other words, *Buteo borealis harlani* is a separately recognizable subspecies, with a definite summer range, a definite migration route, and a definite winter range; true, it shows wide variations in its several characters, overlapping other subspecies, but this is quite consistent with its status as a subspecies.

As to the color characters of the type of *Buteo cooperi*, its tail is just about an average for adult *harlani* (see Swarth's descriptions and comments, and Taverner's plate 1, especially figures 18 and 21). The tail is chiefly white at the base, becoming largely reddish toward the end, but with much confused longitudinal dashing with dusky and with a subterminal black bar and a white ending. The head and shoulders are exactly as for *harlani* in its so-called "light" phase (see Taverner's plates 2 and 3, especially figure 6 on the latter); there is conspicuous lack of any chestnut edgings to the feathers, as compared with *culurus*, and much white shows through. There is also much concealed white in the mantle. The underparts are very light, with no streaking or barring whatsoever on the chest, tibiae and crissum (about like Taverner's plate 3, figure 6). The primaries lack any distinct barring, as emphasized in the descriptions of *cooperi*; but I do find suggestive traces of it here and there. The barring of the primaries varies markedly in the large series of Western Red-tails at hand. The type of *cooperi* shows an extreme but not unique meagerness of it.

There remains just one of the characters ascribed to *cooperi* which, admittedly, is puzzling. This is the "glaucous" tone on the outer surfaces of the closed wings, especially of the outer webs of the outermost primaries. Doubtless this was much more conspicuous in the specimen seventy-five years ago than it is today; for it consists of a sort of "bloom", such as is easily lost by wear. The specimen now shows little of it on the most exposed parts of the flight feathers; chiefly does it appear where the feathers have been shielded from handling. This bloom is quite like that shown normally in *Archibuteo*, in which, in just one year's cycle of wear, it may be nearly or quite obliterated on exposed portions of the feathers. I have been able to find but few specimens in our entire series of *Buteo borealis* and subspecies (113 skins) which show any trace of this bloom. It consists, apparently, of a state of pigmentlessness, hence of white color, of the attenuated tips of the barbules which project upward from the surfaces constituted by the connected barbs. I am at a loss to explain the presence of this "hoary plumbeous cast", as Ridgway (1885) calls it, except on the ground that it is a sport variation involving lack of pigmentation, of a type that happens to be of uncommon occurrence in the Red-tail section of the buteonine group of hawks.

To sum up, my examination of the type of *Buteo cooperi* Cassin in comparison with the other materials at hand, together with all the published knowledge of individual and geographic variations in the group to which it belongs, leads to my determination of it positively as an example of *Buteo borealis harlani* Audubon, as this race has been defined by Swarth. It can be called aberrant in only the one respect, the presence of the "bloom" above referred to. There is no question as to the source of this specimen—that it was actually taken in Santa Clara County, California, as stated by James G. Cooper in various places in the literature where he mentions the matter. This constitutes the only record of the race *harlani*, so far, from California. Yet it is not an astonishing occurrence; strays—vagrants—of other species of birds summering in the same range in which *harlani* regularly breeds (northern interior British Columbia, etc.) frequently get switched off, as it were, from their southeastward migration route and reach California. Only a few miles intervene in northern British Columbia between the narrow Pacific Coast strip and the interior, faunally so different; and occasional crossing by individuals likely occurs, with resulting divergence in southward route to wintering grounds so far apart as the states of Louisiana and California.—J. GRINNELL, Museum of Vertebrate Zoology, University of California, Berkeley, May 27, 1930.

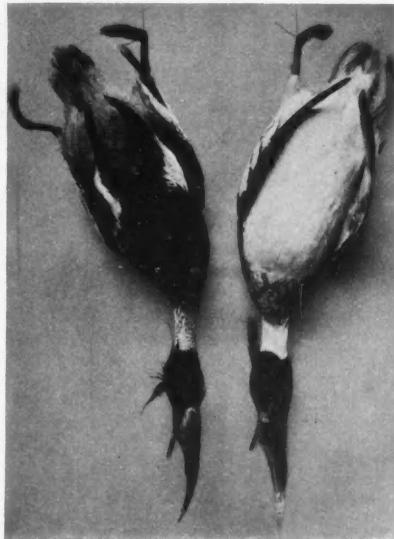


Fig. 93. ADULT RED-BREASTED MEGANSERS WHOSE DEATH HAD BEEN CAUSED IN EACH CASE BY THE ATTEMPT TO SWALLOW A SCULPIN.

**Water Fowl and Sculpins.**—Two instances of water fowl dying as the result of attempting to swallow large sculpins have been brought to my attention recently and are herewith recorded.

In the first instance (figure 93) two male Red-breasted Mergansers (*Mergus serrator*), each with a large sculpin wedged in the throat, were picked up in the sea near Victoria, British Columbia. This was early in May, 1928. I was informed by Mr. W. N. Lenfestey of Victoria, who photographed the subjects, that the spines of the fish, in each case, had passed through the cheeks of the bird.

The second instance, a female Pied-billed Grebe (*Podilymbus podiceps*), was picked up on Quamichan Lake, Vancouver Island, and brought to me by Game Warden Marshall, of Duncan. In this case the sculpin (*Cottus asper*) measured 130 mm. and about half this length protruded from the grebe's mouth. The sharp spines on the preopercula had lodged so securely in the lining of the bird's throat that considerable force was required to remove the fish.—J. A. MUNRO, *Okanagan Landing, British Columbia*, May 15, 1930.

**Under-water Behavior of Red-throated Loons.**—Authorities seem to be divided on the question of whether or not the Red-throated Loon (*Gavia stellata*) employs its wings as an aid to propulsion under water. For example, Forbush (Birds of Massachusetts, I, p. 29) states: "Like the Loon, it uses its wings under water when necessary to increase its speed;" and he quotes Dr. George Suckley to the effect that "the bird used the wings as in flying in addition to the ordinary motions of the feet." On the other hand, Hoffmann (Birds of the Pacific States, p. 3) writes: "Propelled by powerful strokes of its webbed feet, it follows every dart or winding of its victim."

An exceptionally favorable opportunity which I had for watching the under-water behavior of two Red-throated Loons, on April 3, 1930, convinced me that in this instance, at least, they positively did not use their wings. The observations were made from the pier of the San Diego Yacht Club, at Roseville, San Diego Bay. The morning was clear and bright, the tide medium. At the time, the deck of the pier was about seven feet above the water. The beach at this point is almost flat and for 100 feet off-shore the water does not reach a depth of over four feet. The bottom is a hard, muddy sand and, as there was no wind, the water was calm, making conditions perfect for visibility.

Two Red-throated Loons in winter plumage were observed fishing close to the pier and I watched them for fully half an hour. There were numerous schools of small fish from two to four inches in length feeding in the neighborhood. The loons would dive, swim slowly in a large arc until they had driven the fish into shallow water, then each would suddenly put on a remarkable burst of speed, apparently single out an individual fish and, two times out of three, succeed in catching it. As my eyes were only twelve to thirteen feet above the water and as the loons were never over 100 feet away, and at times immediately under me, their every move was noticeable.

The loons did not use their wings while under water but swam entirely with their feet. The speed they developed when they came within striking distance of their quarry was truly remarkable. The head was stretched to the full length of the neck, and the body was compressed until it seemed about one-half of its natural size—in fact the loon became a living projectile offering a minimum resistance and seemed fairly to shoot through the water. The legs were moving at such speed that it was impossible to see their motion. A bird would turn and twist at full speed, without any noticeable disturbance of the water, except when extremely close to the surface. These bursts of speed were of comparatively short duration and whether the fish was caught or not, the loon usually came to the surface immediately thereafter. On several occasions, however, when the first dash failed to net results and the fish was still within striking distance the bird put on a second, though much shorter, dash. The most interesting thing in the actions of these loons under water was their total dependency upon their feet for motive power. The wings were not used at any time but were folded tightly against the body.

Invariably when the loon came to the surface with a fish, the fish was held by the middle, indicating that the strike was from the side and made while the fish was making a turn. The birds, on emerging, always preened themselves and shook the loose water from their feathers. Apparently while on the surface they did not see the fish, but located them only after diving.—J. W. SEFTON, JR., *San Diego Society of Natural History, San Diego, California, April 26, 1930.*

**Do Gray Squirrels Destroy Eggs or Young Birds?**—During the nesting seasons of 1929 and 1930, I have been observing the attitude of nesting birds to gray squirrels and *vice versa*. I have two squirrels on my place, tame enough to feed from my hand, but otherwise wild. One day last spring (1929), hearing some very noisy House Finches (*Carpodacus mexicanus*) outside my window, I looked out and saw a squirrel leaning over the eaves looking into a nest containing eggs, from which it was distant a few inches and within easy reach. It paid no attention to me and after a few minutes, during which the birds were evidently much alarmed, it went off without touching the eggs. Later on, when the young birds were a few days old, the squirrel came again and after examining the nest went off without touching the young birds. The same thing happened this year with a nest in the same place, which is close to a regular route used by the squirrels over the roof. There are other nests close by, easily accessible to the squirrels.

A short time ago, upon hearing grosbeaks (*Zamelodia melanocephala*) crying excitedly, I went out and found them trying to drive a squirrel away from their nest which had two eggs in it. I drove the squirrel off and next day it was back at the same nest. This time I did not disturb it. After a few minutes it went away and the female bird returned to the nest. About a week ago, not having seen the birds about the nest for several days, I examined it and found two dead young in it about one-third grown, not mutilated in any way. I have at other times seen birds trying to drive squirrels from nests but have not been able to ascertain whether they took eggs or young. In the above mentioned cases they did neither.—WALTER I. ALLEN, *Altadena, California, June 30, 1930.*

**The Rocky Mountain Pine Grosbeak in Arizona.**—It is the purpose of this note to place on record the occurrence of the Rocky Mountain Pine Grosbeak (*Pinicola enucleator montana*) in Arizona. Apparently there is no previous record in the literature of such occurrence.

In June, 1929, the University of Arizona summer field class in Ecology spent a week on the Kaibab plateau, north of the Grand Cañon. Water for animals was available there only in occasional pools and small ponds, one of these being all that then remained of "Jacob Lake". Our camp was alongside of Jacob Lake Ranger Station, altitude about 7500 feet, overlooking the remnant of the "Lake", where birds came in considerable numbers to drink. Mr. D. Irvin Rasmussen, then Ranger at this station, asked me to verify his observation that Rocky Mountain Pine Grosbeaks were among these visitors to the water. This I was able to do, recording the

visit of a half-dozen of these birds both morning and evening of June 24. Eight-power prism binoculars were used, and identification was as certain as it was possible to make it on the living birds.

As the Kaibab is comparatively little known, and since the altitude and forest conditions are essentially those in which the species occurs elsewhere, it seems likely that this is a part of its normal range, heretofore unknown, rather than a mere sporadic occurrence. Thus is added another species to the Arizona avifauna.—CHAS. T. VORHIES, University of Arizona, Tucson, Arizona, June 17, 1930.

**Southerly Breeding Record of Sage Thrasher in California.**—Diligent search for a nest of the Sage Thrasher (*Oreoscoptes montanus*) in a more southerly location than any previously recorded finally has been successful. While on one of these hunting trips, April 27, 1930, in company with Fred Frazer and Rex Parker, we located a nest containing five fresh eggs. The locality was about twenty miles from, and a little west of north of, San Bernardino, California, this being fully ten miles south and a little west of Victorville, the most southerly location previously recorded (Rowley, Condor, xxx, 1928, p. 325). The elevation was about 3400 feet above sea level.

The nest was in a shrub of cotton thorn (*Tetradymia spinosa*), eighteen inches from the ground and so well concealed that it could not be seen from above. The bird was flushed from the nest two different times and in each case flew only a few feet, then ran to a juniper bush and became lost to view. It later appeared at close range on top of other bushes and in Joshua trees in company with its mate. Neither bird made any sound while we were at the nesting site.

The nest and eggs seem to be normal in every way. The weights of the eggs in grams are 3.36, 3.23, 3.17, 3.15, and 3.03.

Another nest containing five young birds was found in a similar location a week later and at a point less than five miles northwest of the previous location. In each case there was plenty of *Artemesia tridentata* at hand for host bushes, and it was a surprise to find the Sage Thrashers using the *Tetradymia spinosa*.—WILSON C. HANNA, Colton, California, May 15, 1930.

**Is the Lewis Woodpecker a Regular Breeder in the San Francisco Region?**—The mind retains through life certain outstanding events of childhood days and wanderings. First acquaintance with uncommon birds can be recalled to mind as if occurring but a few months past. One such event of my early life was my first acquaintance with the Lewis Woodpecker (*Asyndesmus lewisi*). I recall that it was in the early spring of the year when I was at the Presidio collecting sea shells with the veteran, Julius Arnheim. A large bird flew overhead which I did not recognize. It lit close by and I was able to see the markings plainly. It was not difficult to find it in the books at home and my list was increased to include the woodpecker "that flew like a crow".

In the "Directory to the Bird Life of the San Francisco Bay Region", Pacific Coast Avifauna No. 18, the Lewis Woodpecker is listed as an "erratic winter visitant." The same publication states that H. W. Carriger found several nests with fresh eggs to small young on May 16, 1926, in the sycamores and oaks south of Sunol, Alameda County. In the Condor (xxix, 1927, p. 165) Hoffmann states that he saw a pair of Lewis Woodpeckers entering a hole in a cottonwood near Gustine, Merced County, April 23, 1926, and that he saw an immature one in July, 1924, at the same place. As recorded in the Condor (xvi, 1914, p. 183) the present writer saw a pair feeding near Pleasanton, Alameda County, June 12, 1914.

The above compilation and my observations of the present spring would lead me to believe that the Lewis Woodpecker is more common in central California during the breeding season than is generally thought.

On April 20, 1930, I was in the vicinity of Coyote, Santa Clara County, about one mile west of the main highway between San Jose and Gilroy. At this point there is a grove of oaks scattered throughout the field and as we drove past, a Lewis Woodpecker flew across in front of the machine. We stopped and I soon found a pair staying in the vicinity of one of the trees but did not locate a definite nesting site. The next Saturday, April 26, I made a special trip to the same locality. The pair of birds was still around the same tree and I located a hole high up in

the living limb which I thought was the nesting site. I also saw two other pairs in the same vicinity and I have no doubt that a careful search would bring nests to light.

On May 18, 1930, the Audubon Society made an excursion to the ranch of Mr. McCoy, located about five miles south of Livermore on the road to Mount Hamilton. On the ride out I saw one pair of Lewis Woodpeckers flying over the creek where the sycamores first are in evidence. A little farther out two more pairs were seen, and I determined to come back later to make more careful investigation.

In the afternoon I walked from the ranch northerly along the creek bed and saw several of the birds and finally located a pair that gave every evidence of having young in the vicinity. One was observed carrying food, and when I was in the vicinity of the nesting site both birds kept up a constant calling. The cry was very similar to the notes of the Hairy Woodpecker except that each note was given individually and not run together as when given by an excited Hairy Woodpecker. But all my watching failed to locate the nest.

On the way home I again stopped and sat around while the parent birds kept up their monotonous cries. Finally one flew to a sycamore about fifty feet distant from the tree which I thought must be the right one and a second bird appeared a short time later. This second bird entered a hole in the sycamore. It only took a fraction of a second to feed the young and fly away after more "stuffing". The nest was in the living trunk of a sycamore and about eighteen feet above the ground. It was impossible to say whether the hole was excavated in the living wood or was just an enlargement of a rotten spot in the tree. I got the impression that the excavation was made in the living wood.

One of the young boys was hoisted up the smooth tree with a convenient tow rope. The nest hole was large enough to enable him to reach inside and take one of the young out for inspection. It appeared to be about a week old as its eyes were still closed. The little one tried to swallow the finger of its captor and we hurriedly replaced it in the nest. The little birds kept up a constant squeaking which sounded more or less like steam escaping from an engine. After the boy started to climb to the nest the parent birds kept quiet although they were in the vicinity.

We had opportunities to watch the parent birds in the vicinity, apparently getting food for the nestlings. One perched on fence posts and occasionally flew out as if catching insects. At other times it would fly down to the ground and pick up something, probably a grasshopper. We saw another one perch in an olive tree and take something from the foliage.

It is easy to overlook these birds during the earlier nesting season as they will sit for long periods on the upper sides of limbs in the oaks or sycamores and will not fly when a person is near. When the feeding period commences, however, there should be no trouble in noticing the birds, as it takes constant work on the part of the parents to keep the youngsters supplied with food. Their insect catching habits can easily be mistaken for those of the California Woodpecker, especially at a distance. It would add to our knowledge of distribution if close watch be kept for this interesting bird in the sycamore groves of our interior Coast Range streams and among the oaks where the California Woodpeckers are found.

On June 1, 1930, I went into the territory back of Sunol and found about twelve Lewis Woodpeckers breeding. The nests were in the sycamores along San Antonio Creek, with the exception of one which I suspect was in a large valley oak. The parent birds were much disturbed by our presence. I also noted the parent birds out in the open fields gathering food, probably grasshoppers.—L. PH. BOLANDER, *Oakland, California, June 5, 1930.*

**The Pintails of Northwestern Alaska.**—On my return from Alaska in 1922, I submitted from the Colorado Museum of Natural History some specimens of the pintail duck to Dr. H. C. Oberholser for identification, and he reported on them as follows: "Those from the Seward Peninsula and Wainwright are *Dafla acuta acuta*, but the one from Point Barrow seems to be *Dafla acuta tzitzihoa*." I recorded two of these specimens (*Condor*, xxvi, 1924, p. 195) and others (*Condor*, xxvii, 1925, p. 169) as *acuta*, and, subsequently, a female in the collection of the Chicago Academy of Sciences (*Condor*, xxxi, 1929, p. 225) which was also so identified by Dr. Oberholser.

Additional specimens have been received during the past few years, and these are in the collection of the Chicago Academy of Sciences. I sent these to Dr. Oberholser and he kindly examined them for me, advising me as follows:

"I have carefully worked over the specimens in this consignment of yours, and having this larger series of pintails, particularly of males from northwestern Alaska—evidently breeding birds, I have finally come to the conclusion that they are all the American pintail, although somewhat intermediate and showing a tendency to the European form, *Dafila acuta acuta*. I know that I have identified for you previous birds from the same region, chiefly females, which are difficult to determine, as the European bird, but I am now inclined to think that these, as well as those you now send, are all rather intermediate individuals of the American race. The latter is not a very strongly differentiated form at best, and with only one or two birds at hand to identify, it is often not easy to determine to what race they should be referred. Some of the birds that you previously sent are rather small, and from this I concluded that they probably were the European bird, but those in this last lot average so much larger that it seems to be best to call them all *Dafila acuta tzitzihoa*. In such cases it is rather unsatisfactory to have only a single bird for identification, but of course we have to do the best we can."

The specimens including those from the Colorado Museum of Natural History were sent to Mr. James L. Peters of the Museum of Comparative Zoology, for his inspection. He writes the following:

"Going over the pintails has naturally involved comparing them with good characteristic examples of undoubted *acuta* on the one hand, and with *tzitzihoa* on the other. The adult males of the latter race are easily recognized by their much longer and somewhat wider central tail feathers. I can find no color characters in the male, and no way at all of telling the females with any degree of certainty. *Acuta* averages very slightly shorter winged and with an average shorter and narrower bill, but, while these averages may be enough to help characterize the subspecies, there is so much overlapping that no individual can be identified on such a basis. And moreover, when the wings are considerably worn, as in the case of many of your Alaskan specimens, mensural characters do not help much. So you see it all boils down to adult males in fresh plumage; females, young, and males in eclipse are out of it altogether. On the strength of your males, I should say that the breeding pintails of northwest Alaska show an approach to *acuta* and are therefore not quite typical *tzitzihoa*, but are much nearer the latter race as an aggregate, although certain individuals like nos. 9305 and 9870 (Colorado Mus. Nat. Hist.) are very close to *acuta*. I think on the whole the breeding bird of northwestern Alaska should be called *tzitzihoa*."

In view of the above, then, it seems best to call all Alaskan pintails *tzitzihoa*, in spite of the fact that there is little doubt that pintails from the Asiatic side fly across Bering Strait to the Alaskan shore. Snow geese and little brown cranes regularly pass from the American side to Siberia, and Asiatic birds occur regularly at Wales when conditions are favorable; also I have seen pintails in flight over the Strait. Considering the fact that there is so little difference between the two forms, I agree with Dr. Oberholser and Mr. Peters that the identification of Alaskan birds should be based on geographic grounds, and that the specimens which I have recorded, as noted above, should be considered *Dafila acuta tzitzihoa*.—ALFRED M. BAILEY, Chicago Academy of Sciences, Chicago, Illinois, July 1, 1930.

## EDITORIAL NOTES AND NEWS

The Cooper Ornithological Club was represented formally at the Seventh International Ornithological Congress held in the first part of June in Amsterdam. The Club's delegates were: Mr. Harry S. Swarth, who also spent part of the summer working in the museums in London and Tring; Mr. H. van Straaten, a one-time enthusiastic bird student with us here in California, but now resident in Holland; Dr. Casey A. Wood, who has spent the current year in various countries abroad; and Dr. Alexander Wetmore, who also visited briefly various museums in European cities. From all accounts, the Congress was highly successful.

According to a recent reckoning, nearly one-third of the Cooper Club's membership is resident of the United States east of the Rocky Mountains; but little in excess of one-half is resident within the State of California. Our organization, then, can hardly merit any statement to the effect that it is altogether provincial. However, relative to the American Ornithologists' Union, we are representative of a rather restricted group of bird students. In no sense, can the Cooper Club as an organization be considered as equivalent to, or supplanting, the A. O. U. As a matter of fact, upwards of one-half our membership belongs also to the A. O. U. It is advisable, therefore, for Cooper Club members, those living west of the Rockies as well as east, to make every effort to attend the annual meeting of the A. O. U., to be held this year, October 20 to 24, in Salem, Massachusetts. Secretary T. S. Palmer states that prospects are favorable, by reason of geographic location and of increased membership, for a greater attendance this year than in any preceding year of the Union's existence.

We deplore the tendency toward establishing journals representative of subjects smaller and smaller in scope within the general field of ornithology. The establishing of a magazine of bird banding in the East is an example to be cited. It is too bad that the really valuable research results from that field of investigation should not be published regularly in the *Auk* rather than being "buried" from the access of many active ornithologists in an exclusive journal. Bird banding is merely a method of obtaining information of essentially general per-

tinence in ornithology. Anything worthy as a contribution in the field of ornithology, that comes by the way of the banding method, ought to be made available in the journal of widest circulation among ornithologists at large. In this connection we commend the decision of the Western Bird Banding Association to use the *Condor* for all of its contributions which are of scientifically ornithological value. Methodology and matter of the nature of personal news are properly made available to the members of that association through a mimeographed News Letter.

We know, not one, but at least three individuals, who dislike the Mockingbird. By such persons, the Mockingbird, blatant, loud of voice, not content to announce itself only by day, is an irritation, to be gotten rid of in any neighborhood. Some other people hate Blue Jays; others are offended by the aggressive attitude of Brewer Blackbirds in the nesting season and demand to be rid of them; other people despise the House Wren; others hate hawks and owls; and so it goes. We venture to say that scarcely a species out of our entire North American list would escape condemnation from some person or other. Logically, if all such complaints are to be *heeded*, then the only thing to do is at once to undertake wholesale extermination of every living wild bird and mammal! It seems to be "human nature" to want to make way with any animal that is in any degree annoying or destructive, no matter what other qualities it may have, and even to seek destruction of anything that can be stigmatized as of "no use." This is an absolutely unreasoning attitude of mind, inherent though it may be. It is economically and ethically *wrong* to take advantage of that human, let us say *inhuman*, trait, in devising and putting into effect campaigns of extermination (more delicately referred to as "control") against any sorts of birds or mammals, at least without the most painstaking and long-continued consideration of the deeper lying factors which must be accurately weighed. The tendency manifest in various directions promptly to yield to pressure from minority interests to eradicate "pests" can, we think, lead directly or indirectly only to the complete wiping out of a large part of our native fauna.—J. G.

*The Book of Bird Life*, by Arthur A. Allen of Cornell University, published early in the year by the D. Van Nostrand Company, Inc. (250 4th Avenue, New York, price \$3.50), is being received, we understand, most cordially. Already, the first edition is entirely exhausted, and a new one is coming out. This is well merited recognition of what is perhaps the best book yet dealing with the problems involved in the living of birds, in brief compass, and fully and attractively illustrated. It is thus a stimulative book for the use of teachers in the schools. Also, although non-technical, it contains a good deal of suggestive material worth the reading by the more advanced student of ornithology.

#### MINUTES OF COOPER CLUB MEETINGS

##### NORTHERN DIVISION

**APRIL.**—The April meeting of the Northern Division of the Cooper Ornithological Club was held on April 24, 1930, in Room 2003, Life Sciences Building, University of California, Berkeley, at 8:00 p. m., with Vice-president George Wright in the chair and about sixty members and guests present. Minutes of the Northern Division for March were read and approved. Minutes of the Southern Division for March were read.

Applications for membership were presented from Miss Pauline Schulthess, Kelseyville, Lake County, California, proposed by Mary M. Erickson, and Clifton B. Shoemaker, P. O. Box 14, Glendora, California, proposed by J. Grinnell. Miss Pringle reported for the Cooper Memorial Committee and stated that a bronze tablet was being considered.

Dr. Evermann told of a recent visit to Pardee Dam where he saw a large number of Cliff Swallows prospecting for nesting sites, although no swallows were there last year, and he suggested that the impounded water might attract many new birds to the vicinity. Mr. Wright reported having seen four American Egrets along the Salinas River during the third week in April, also a White-tailed Kite near Gilroy. Mr. Adrey Borell stated that on a recent visit to Panache Pass with Mr. Tyler and Mr. Ellis he had found a dead Red-tailed Hawk near the remains of a rattlesnake and the inference seemed clear that each had caused the death of the other.

The formal program of the evening con-

sisted of a symposium upon "The American Game Policy." Mr. E. L. Sumner, Jr., presented an admirable review of the "Report of the Committee to Formulate an American Game Policy" [American Game, Bulletin of the American Game Protective Association, pp. 13-16, December, 1929, January, 1930], and distributed to members mimeographed copies of an outline of the paper. Mr. Joseph S. Hunter and Mr. Donald McLean, of the California Division of Fish and Game, read at length from the "Transactions of the Sixteenth American Game Conference" papers advocating changes in the American game policy, with reasons therefor. Mr. Joseph Dixon told of the steps being taken by the National Parks toward the preservation of wild life and of the setting aside of "Wilderness Areas." Mr. H. V. La Jeunesse of the Hayward Pheasantry closed the evening's program with a most interesting account of the rearing of game birds in captivity. His hearers were surprised to learn that many more young are reared from a domesticated pair of Quail or of Mallard Ducks in a season than are reared in the wild.

Adjourned.—HILDA W. GRINNELL, Secretary.

**MAY.**—The May meeting of the Northern Division of the Cooper Ornithological Club was held on May 22, 1930, in Room 2003, Life Sciences Building, University of California, Berkeley, at 8:00 p. m. In the absence of president and vice-president, Joseph Grinnell occupied the chair. Fifty members and guests were present. Minutes of the Northern Division for April were read and approved. Minutes of the Southern Division for April were read.

Reports from the field were the order of the evening and members responded generously. Dr. Ritter told of watching gulls alighting on piling along the Bay front and suggested that Club members having opportunity so to do photograph the birds in the different postures assumed in settling in order to show the number and variety of body members brought into play and coordinated into simultaneous action. Mrs. Allen reviewed notes which she had taken for several days on the activities of a pair of Hutton Vireos which started to build a nest in an oak tree outside her window.

Mr. Harold W. Clark of Angwin, Napa County, described the faunal position of his home territory on Howell Mountain

and the way in which it is reflected in avian distribution. Miss Josephine Smith contributed an account of the belligerent manner in which a Golden-crowned Sparrow pulled the tail of a greedy Quail at her feeding table in Strawberry Cañon.

Mr. Alden Miller reported upon the activities of two pairs of Bullock Orioles observed near Pinole, the males arriving two weeks in advance of the females, and he commented on the defense of territory and courtship activities of the four birds. Mr. Cain told of birds observed about the Boy Scout Camp in the Oakland hills and of the late lingering of the Red-breasted Nuthatches.

Mr. L. Ph. Bolander discussed birds seen by members of the Audubon Association of the Pacific on an outing meeting held May 18 at the McCoy Ranch in the Livermore hills. Among the most interesting of these were three pairs of Lewis Woodpeckers. Adult Cowbirds were also seen by this group. Leslie Hawkins told of many observations made during the month, including a possible record of an Arizona Hooded Oriole in Reliez Valley. This record was of especial interest since another observer, Gordon Bolander, reported the same species seen on an Oakland lawn, which suggested invasion by this bird, hitherto unlisted for the Bay region.

Mrs. Mead told of seeing eight Black-crowned Night Herons along the Sears Point cut-off, a White-tailed Kite near San Quentin, and seventeen young Mallards with an adult on the chain of lakes in Golden Gate Park. Mr. Otto Emerson reported the taking of a Cowbird at Santa Cruz in 1880 by George Battinger. Many of the other interesting records given during the evening are necessarily omitted here for lack of space.

Adjourned.—HILDA W. GRINNELL, Secretary.

#### SOUTHERN DIVISION

MAY.—The May meeting of the Southern Division of the Cooper Ornithological Club was held on Tuesday evening, May 27, 1930, at the Los Angeles Museum, with about fifty members and friends present and President Willett in the chair. It was moved, seconded and carried that the reading of the minutes of the April meetings be omitted.

The following applications for membership were read: Ralph G. Kirk, 342 N. Rockingham Road, Brentwood Heights Station, Los Angeles, Calif., proposed by

J. Grinnell, and Donald McLain, 2780 Rose Avenue, Altadena, Calif., proposed by Blanche Vignos.

President Willett presented a letter from John B. Price, of the Glendale High School, stating that he had trapped some gulls, banded them and marked their breast feathers with red paint. He wishes to be notified as to where and when any one happens to recognize these gulls.

A letter from the United States Senate Special Committee on Wild Life Resources was read by Mr. Willett. This letter told of the appointment of this special committee for the purpose of investigating all matters pertaining to the replacement and conservation of wild life with a view to determining the most appropriate methods for carrying out such purposes and making recommendations for necessary legislation. The Cooper Club is asked to give the committee all possible help in the study of conservation and the enacting of federal laws pertaining to it. President Willett recommended that the matter be referred to the Conservation Committee of the Northern Division. Dr. Miller so moved and the motion was carried.

The situation in regard to bird life on the islands and shores of Salton Sea was discussed by President Willett. He pointed out the possibilities for both good and harm to the birds in the activities of the gun clubs. Following his suggestion that a committee be appointed to try to see that the results are good rather than harmful, Dr. Miller moved, the motion being seconded and carried, that the President be empowered to act either personally or through a committee in keeping in touch with the situation and bringing all possible influence to the protection of these birds.

Mr. Robert T. Moore, the speaker of the evening, told of his recent trip to the Andes of Ecuador and particularly of his climbs up Mt. Sangai and Mt. Chimborazo and of the birds seen and collected there. He showed interesting motion pictures and most beautiful slides, the latter being photographs taken in the natural colors. The statement is significant that the success in climbing Mt. Sangai was due to the fact that the party had other interests (birds, mammals and flowers) along the way. The unassuming and forceful portrayal of the expedition, the country, the birds and their habitats was a delight to all present.

Adjourned.—HAROLD MICHENER, Secretary.

